RAILROAD GAZETTE

FRIDAY, AUGUST 10, 1894.

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Contributions.

Rails Damaged by Fast Running with a Freight Engine.

LEXINGTON, Ky., July 29, 1894.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In answer to the articles in the *Railroad Gazette* of July 20 and July 27, relative to the "Hammer Blow of Locomotives," I will relate a bit of experience. About the first of this month I received a message from a section foreman to have all trains run carefully over a piece of track about half a mile long, saying the track was badly out of line and dangerous. The division engineer looked at the track and said it must have been damaged by a broken wheel. Afterwards the roadmaster said it must have been done by an engine with a badly worn tire and a hard spot on the outside part of the driver, as the rails were bent *downward and inward.* It could not have been done by the sun, as it was only on one line of rails and the bends were very short and sharp The day was very hot; still it was not a warp. The division engineer having said it was a broken wheel, we hunted for a broken wheel. But if it was a broken wheel, why did the damage manifest itself for such a short distance? Next we hunted for a "double flange" and could not find any bad ones. After the article of July 27 we looked for the trouble on some eight-wheelers running on passenger trains, but could not find anything wrong. Then it was suggested to measure the distance between dents. This was done and we found they were made by a fifty-inch wheel. Then an examination of the mogul engine on the local freight revealed marks on rear driver, right side and directly under the counter balance. The engine has been laid up. All of the bent rails were at the foot of grades. and they were found in three different places and within less than two weeks.

Why did it not happen before? This is our first experience and there had not been any change in the engine drivers during the last six months.

DISPATCHER.

[We cannot tell why it did not happen before; but, to venture a guess, would suggest that never before was the engineer in such a big hurry to get to the end of his trip.—EDITOR RAILROAD GAZETTE.]

More Experience with the Locomotive Hammer Blow.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I am gratified to see by your note under the letter of "Bridge Engineer," in the issue of July 27, that you recognize the destructive effect of the locomotive hammer blow. The writer of the article referred to by "Bridge Engineer" is a member of the American Society of Civil Engineers, and has at various times mentioned this subject to other members who devote themselves to Bridge Engineering. There are cases where the floor systems and lateral bracing in bridges have had to be strengthened owing to the excessive strains and vibrations caused by high speeds, though the floors and lateral bracing would have been sufficiently strong for speeds not exceeding 60 miles an hour, or with perfectly balanced engines at any speed.

An instance is on record where an engine with one car running at a high rate of speed commenced jumping, on a pin-connected deck bridge, and the drivers were actually seen to leave the rails at intervals by a person who stood on the bridge at the time the train passed. The marks on the rails, and the bends in the rails, together with the testimony of the persons on the engine, corroborated the story of the observer. The blame was, of course, laid upon the bridge, and the railroad engineers put in an intermediate truss and strengthened the floor. The rails were removed and heavier ones substituted, but they to-day show bends caused by imperfectly balanced engines. In this case, as in all other extreme cases, the bends and marks on the rails reached their maximum at distances equal to the circumference of a 68-inch driving wheel.

Probably "Bridge Engineer" does not know that some railroad master mechanics guess at the amount of counterbalance required in locomotive driving wheels, and then ride on the engines to test the accuracy of their guesses. The way in which the engines ride upon the bridges decides whether more or less counter-balance is required. It is assumed that if the bridges have light ties and track stringers, that the rigidity at the panel points has more to do with deciding the question than any actual surplus or deficiency of counter-balance. HEADLIGHT.

The Leonard Block Signaling Apparatus.

RICHMOND, Va., Aug. 1, 1894.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Referring to the statement in the last paragraph of the description of the Leonard Block Signaling Apparatus contained in your issue of July 27, that the system in its various forms is the property of and is manufactured by the Electric Selector and Signal Company, I beg to say that this is not the case.

No assignment of letters patent No. 517,419 issued to me March 27, 1894, upon which this system is based, nor the improvements thereon, has been made to the Electric Selector and Signal Company. But that company have instituted legal proceedings to compel such assignments on the ground that an agreement to assign improvements on a prior patent entitles them to the new one. My answer to their bill fully justifies my denial of their right to letters patent No. 517,419.

This system of signaling, therefore, is solely and wholly owned and controlled by me, and I am prepared to furnish the apparatus myself on reasonable terms.

M. B. LEONARD.

NEW YORK, Aug. 2, 1894.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Mr. Leonard is obviously in error. He certainly cannot own and control letters patent No. 517,419—much less the "system" of which they are part—for he has been under an injunction of the United States Circuit Court at Richmond, Va., in respect of them, since last May. This company was at that time compelled, in defense of its property, to invoke the aid of the court named, and in so doing filed the following proofs of ownership among others:

1. Mr. Leonard's agreement of Dec. 18, 1891, selling "his invention of a lock, block and station signaling system," and agreeing to also transfer "all improvements which may be made hereafter by Leonard applicable to this system of signaling."

2. His assignments dated Aug. 30, 1892, of the patents so far applied for, and his covenant and agreement under seal, to "sell, assign and convey," to the same purchaser, "all improvements thereon now made or which may be made hereafter by me, the said Leonard, aplicable to this system of signalling," and to "execute any instrument necessary to complete the title of said company in the same."

3. His vouchers for the entire cash consideration $4,500), all of which was paid in advance of its due date, his letters requesting this company to pay the costs of this patent, No. 517,419, and the evidence of these payments; and his formal and constant acknowledgment for a whole year and up to within five days of the issuance of the patent, that it was the property of this company.

Mr. Leonard at the eleventh hour declined to execute the covenanted assignments, alleging only "good and sufficient reasons" for his action. We have asked the United States Court to pass upon the goodness and sufficiency of whatever "reasons" Mr. Leonard may be able to offer. Having paid our money, we naturally want to get our goods. Meanwhile we shall assuredly hold liable any one making, selling or using these signals without our license.

ELECTRIC SELECTOR AND SIGNAL CO.,
By C. P. Mackie, General Manager.

Bribery in the Form of Passes.

CHICAGO, Aug. 5, 1894.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice your quotations from Mr. J. T. Brooks' letter to the president of the New York Constitutional Convention and your commentaries upon them, all concerning free passes. So far as they go they are just; but you and Mr. Brooks do not state the worst feature of the issue of passes, although of course it may be inferred from the bare fact that the judges of our courts not only receive them, but ask for them. And although the time may not be ripe for an agitation against passes, whenever the subject is mentioned it will not do to omit saying that passes are constantly used as a means of bribery and corruption, and may be employed so insidiously as to undermine the firmness of almost every one in the performance of duty. This is one reason why the poor who bring suits against railroads have a small chance of success; they must employ such men as would and do find in a pass reason for advising a compromise settlement out of court. What can the widow and orphans of a railroad victim expect when the probate judge and the attorney for the widow are each using the railroad company's passes?

From whatever cause it may have come to be, our countrymen seem to be possessed with the hope of getting something for nothing, and one of the principal means of alleviating this appetite now is by the issue of passes. If the New York Constitutional Convention will recognize the criminal character of the transaction and make it punishable as such, I believe there are a few persons living who will zealously prosecute open offenders, and a beginning will have been made towards the suppression of the wickedness I have here referred to.

ARCHIMEDES STEPHENSON WATT.

The Most Suitable Metal for Brake Shoes.

PHILADELPHIA, June 30, 1894.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice in your issue of July 20 an article signed X. Y. Z., criticising the article of the writer published in your issue of June 15, on the subject of metal for brake shoes.

The statements made and the conclusions drawn at that time were based on reports received from a number of railroads that had been making tests of brake shoes. If the Pullman Company's experience has been different from that of every other company we are not awaie of it nor can we believe that their experience could possibly be radically different from that of every one else who has made continuous tests.

It is not difficult to make assertions that certain results will occur from the use of soft steel, nor is it difficult to advance theories, but in the face of the statements of many of the ablest motive power men, based on practical tests, to the effect that no such results have occurred, they cannot have much weight. The M. C. B. Association has a large and able committee now investigating this subject. This committee has been experimenting for the past year with all kinds of brake shoes that have been offered, and has thereby obtained valuable information. We believe the members of this committee are seeking for truth in the inward parts and they have every facility for accomplishing their object. Their report will doubtless go far towards settling this question.

It was not our purpose to get into a controversy with any manufacturer of brake shoes, but simply to give the information we had received and our views as to why such good results had been obtained. A newspaper discussion will not in the least alter the results of practical tests.

CHAS. T. SCHOEN.

The Authority of the Interstate Commerce Commission.

CINCINNATI, July 28, 1894.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read your article in this week's paper and regret that there is no prospect of the passage of the Patterson bill to amend the Interstate Commerce Law. While in general I agree with your views I think the reasons for deploring the inaction of Congress ought to be still farther emphasized, for there are important details in which this law would establish a valuable precedent, in addition to the main point named by you. One of these is the provision which makes the findings of the commission prima facie sound. I refer more particularly to the clause under which a pool, when declared by the commission to be against the interests of the public, must be suspended at once. This is a much needed reform. Hitherto the railroads, backed up in nearly every case by the courts, have always assumed that an order of the commission was wrong unless some one could prove to them otherwise, and they have never obeyed such orders unless they saw fit. But what is the use of having this august tribunal, to be maintained at great expense by the government if it must make a contest before another tribunal for the enforcement of every one of its decrees, no matter how small?

The circumstances connected with the recent decision on freight rates from Chicago and Cincinnati to the South illustrate my point. The railroads, as usual, came to the conclusion in very short order that they would ignore the command of the commission, in spite of the fact that the decision gave very strong reasons, showing the unreasonableness of the tariff rates. As it happens, however, one of the principal roads affected by the order is in the hands of the United States Court, and the presiding justice of this court, Judge Taft, very sensibly concludes that the deliberate decision of the Interstate Commerce Commission is not to be lightly thrust aside, and he says that the road, the Cincinnati, New Orleans & Texas Pacific, must obey the order until the rates named in it are shown in court to be unreasonable. Thus we have in actual practice, in this case, as is proposed in the law legalizing pooling, the rational principle that a decision of a dignified body like the Interstate Commerce Commission is to be deemed reasonable and just until it is shown to be otherwise.

Even on the theory that the commission is only a recommendatory body, whose opinions are to hold only when all parties voluntarily acquiesce, there is much to say in favor of making its decisions binding until they are reversed by a court. The commissioners sit as arbitrators on intricate questions. After all their careful investigation and study of such questions why should not their conclusions stand until reversed by some tribunal or body which shall have examined the case with equal care and thoroughness? E. W. N.

Electric Lighting on the Chicago, Milwaukee & St. Paul.

There was published in the *Railroad Gazette* of July 27 a synopsis of a paper by Mr. M. B. Leonard on the electric lighting of railroad trains, in which extended reference was made to the system developed by Mr. Geo. Gibbs and used on the through trains of the Chicago, Milwaukee & St. Paul. The heat and light tender used on these trains

in winter was fully described and illustrated in the *Railroad Gazette* of June 13, 1890. We are now enabled to show the general arrangement of the apparatus placed in the baggage compartment of the buffet cars for summer use, and also an interior view, showing the location and arrangement of lamps in the passenger compartment of that car.

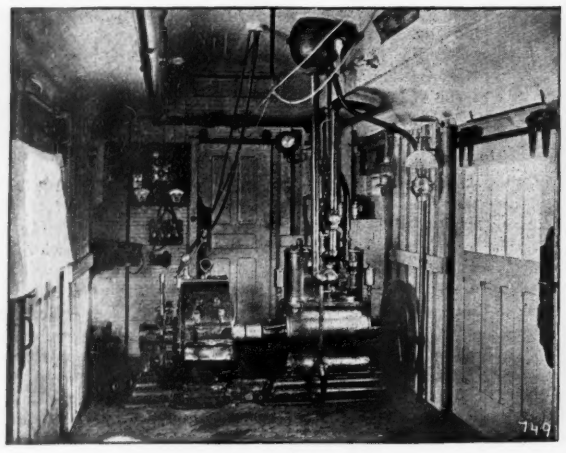


Fig. 1.—Electric Lighting Apparatus in Baggage Compartment of Buffet Car, C., M. & St. P. Ry.

Fig. 2.—Interior of Buffet Car, Showing Arrangement of Electric Lights, C., M. & St. P. Ry.

In the end of the car next to the tender of the engine is placed a small Westinghouse engine of 18 horse power, directly connected with a 12 kilowatt dynamo, and taking steam from the boiler of the locomotive through an overhead coupling like those used for the heating pipes on this road. The cars are all wired on the "return loop" system, thus making the length of circuit (positive and negative together) to any one lamp in the train the same as that to any other lamp, no matter what the length of the train may be, and greatly decreasing the difficulty of keeping the candle power uniform throughout the train.

At the end of the car by the side of the door is placed a small switchboard with the necessary switches and instruments for the measurement of current and voltage, and near it a small rheostat for regulating the candle power of the lamps.

Arrangements are made at Milwaukee by which current is taken from the passenger station lighting plant while locomotives are being changed. This is readily accomplished by placing a flexible cord connection from the station mains in a convenient position to be reached from the buffet car when the train stops. This cord is plugged into the connector, described in our issue of July 16, 1892, and shown on the photograph immediately below the switchboard.

As the throttle of the small engine is closed a switch is thrown, transferring the load to the station circuit. When the locomotives have been changed, the steam connections made and the engine and dynamo brought up to speed, the load is again transferred and the connection with the station circuit broken. By this means it is possible to keep up the light continuously without the aid of storage batteries, an important feature.

By reference to the engraving showing the interior of the passenger compartment of the car it will be observed that the lamps are placed overhead for the general lighting of the car, while for reading, lamps with opaque shades are placed along the side of the car between the windows. These can be turned out if desired by the occupants of the car. The use of electricity for lighting through trains may fairly be considered to have passed the experimental stage on the Chicago, Milwaukee & St. Paul, though further development is not unlikely. At all events the service is giving good satisfaction to the patrons of the road.

Louisville & Nashville Express Car Without Platforms.

The weakness of passenger car framing is a matter that has recently received considerable attention from those interested in car construction. Several disastrous collisions last year showed conclusively that there exists a decided difference in the strength of the framing of various cars as now built. One of the weakest points is in the usual platform construction, as the cars which have been through a collision at moderate speeds will show. Not infrequently the hood and platform of a car are smashed, and other parts but slightly damaged. A comparison of passenger and freight train wrecks will serve as the basis for an estimate of the relative resistance to telescoping of the two styles of framing.

Changes will probably come slowly. Except for the necessity of providing a suitable means of entrance and exit, the platform would probably never have been considered an indispensable part of a car. This being the case, it is difficult to explain why the cost and weight of baggage, postal and express cars are increased by building on the ends of each a device for which there is little or no use.

We are indebted to Mr. Pulaski Leeds, Superintendent of Machinery of the Louisville & Nashville, for drawings of his standard express car, which, as will be observed, is without platforms, and shows evidence of careful designing and a thorough appreciation of the problem. The sills are evenly distributed over the width of the car and are eight in number. The center sills and four intermediate sills are 4 by 7¼ in. in section, and the two outside sills 5½ by 8½ in. All are joined to the end sill as shown, and are spaced with 1¾ by 7¾ in. bridging at intervals of about 18 in. Transverse sill tie rods pass from each side of the opposite center sill. The longitudinal timbers are trussed by four 1¼ in. rods, two of which are placed just inside the outside sills, and the other two close to the inner side of the intermediate sills. The end sills are 6x13 in. in section. The buffer beam is 6x7 in. in section and is fastened to the end sill by four ¾ in. bolts. A wooden body bolster is used and trussed by four 1 in. rods passing over the two center sills.

The side framing is reinforced by a ⅜x2 in. iron strap passing over the tops of the intermediate posts and through the side sills near the corner posts. The main posts are 6 and 3x2¾ in. in section, and the braces 6x2¾ in. section. The sill plate corner tie rods are ¾ in. and those along the side of the car ⅝ in. in diameter.

The construction of the roof is simple and substantial, as shown in the side and end elevation and in the sectional view. The side doors are placed in the center of the car and are 4 ft. in width. The end doors are 22 in. in width and open upon the buffer. The brake wheel is hung at the side of this door and is connected to the brake gear in the usual manner by a chain and sheave.

Notes on German Railroad Practice—Locomotive Design.

BY MR. E. M. HERR.

The German locomotive has been said to be designed more in accordance with English than American practice, that is, it has in general plate frames, no bogie or radial truck, wrought iron or cast steel wheel centers instead of cast iron, rigid wheel base under the tender, a copper fire-box, a small metal cab and no pilot. The American practice of pivoted leading trucks or carrying wheels, is, however, rapidly coming into use in new designs, and in the latest types both of heavy passenger and freight locomotives these devices have replaced the old rigid carrying wheels.

The general design of the boiler is that known as the locomotive type. The method of staying the crown sheet varies in different localities but the radial stay bolt method is most generally used. In order to overcome the difficulty with the rigid stays near the fire-box tube sheet, sometimes experienced with this method of staying, the device shown in fig. 1 is used. It consists of short crown bars taking but the three first bolts back from the flue sheet. One end of the bar rests upon the top edge of the flue sheet while the other is slung from the roof by a link stay, around the lower pin of which this bar can rotate and so accommodate itself to the slight upward movement of this part of the crown due to unequal expansion. All the stay bolts in the sides and back of the fire box are copper, and it is the universal practice to drill detector holes in them as well as in the radial crown stays. These holes are not covered by the jacket and lagging, but an opening over each is made in the overlying jacket and lagging. The copper fire-box sheets vary slightly in thickness in different localities and in boilers carrying different steam pressures, but generally fall within the following dimensions: Tube sheets, $\frac{13}{32}$ inch to 1⅛ inches, crown sheets ⅝ inch to $\frac{13}{16}$ inch, side and back sheets $\frac{5}{16}$ inch to $\frac{23}{32}$ inch. The fire-box tube sheets are invariably thinned below the tubes to the thickness of the side and back sheets. The front flue sheet, although of steel, is usually within $\frac{1}{16}$ inch as thick as the copper fire-box tube sheet. Tubes are generally of steel with copper fire-box ends 3 or 4 inches long braized on, and are expanded and beaded over in the ordinary way. The dome is placed well forward and generally on the first course of the shell. This enables a very short dry pipe to be used and often is accompanied by a connection from the throttle lever to the throttle entirely outside of the boiler shell, the connecting rod passing through a stuffing box in the side of the dome. The throttle valve is always of the slide valve pattern. On the older boilers the steam pressure is 147 lbs. per square inch, but on all new designs 176 to 205 lbs. is used, the former pressure being most common.

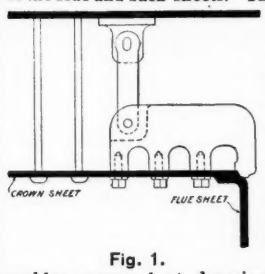
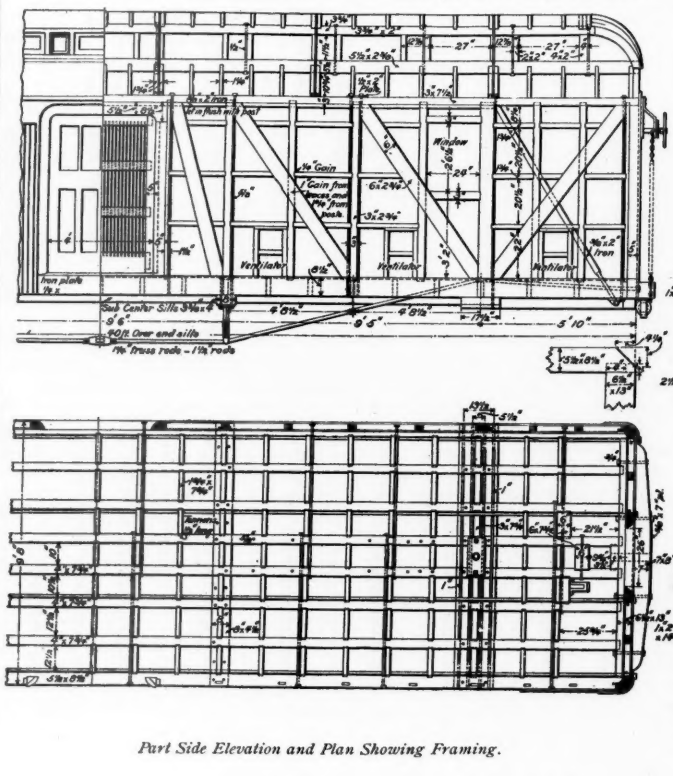


Fig. 1.

Unlike American locomotive practice, in which the Stephenson valve motion is almost universal, the kind of valve gear used, and its arrangement, varies greatly. Almost all engines with steam chests in the saddle have the Allen motion with crossed rods. Engines with outside steam chests have either the Allen Walschaert or Heusinger von Waldegg motion. By far the most common design of valve motion is the Allen straight link with crossed rods. The maximum travel of the valve is generally somewhat smaller than in American practice, ranging



Part Side Elevation and Plan Showing Framing.

End Elevations and Cross Sections of Sides.

Express Car Louisville & Nashville Railroad.

from 4¾ inches to 5⅛ inches, but few engines exceeding a maximum travel of 5 inches. Formerly the outside lap of valve was almost always less than one inch, but in later designs of express engines longer outside lap is almost universal, being generally about one inch but reaching in some cases 1¼ inches. Sometimes a very slight inside clearance is given on simple engines but generally they are either line and line or with a very small inside lap.

Compound locomotives of the von Borries and Lindner types are in quite general use, the former particularly in Prussia and Würtemberg. But few other methods of compounding are used and no compound engines of the four-cylinder type are to be found. In the von Borries Compound, which is very largely used and well thought of, the high-pressure valve is always given inside clearance, as much as $\frac{5}{16}$ inch being used. The low pressure valve is either line and line or with not to exceed $\frac{3}{32}$ inch clearance. The steam ports in German locomotives are much shorter than is here considered good practice, 13-inch ports with 17-inch cylinders not being unusual in new designs, while many older engines have even shorter ports with the same size cylinders. Unbalanced main slide valves are universal, probably accounting largely for the short ports so generally used. Many main valves are made of bronze and in some cases pieces of Babbitt metal are inserted in the wearing face.

The size and proportions of main bearings differ but little from American practice. The bearing metal is almost always brass, with strips of white metal containing about 80 per cent. of tin. On the Prussian roads in the Hannover district a white metal consisting of 80 per cent. tin with antimony and copper is used alone for bearing metal. This material is cast into wrought iron driving box shells, which are then bored out and fitted to the journal. When worn out the bearing is melted out of the shell and a new one run in.

There are almost no inside connected engines and therefore no crank axles are used. Driving axles are almost always steel and breakages exceedingly rare. During the year 1892 on all the railroads of the German Empire there were 1¼ broken axles of all kinds under engines and tenders for every 10,000,000 miles run. All axles as well as piston rods, pins and other parts where a change in diameter is made in members subjected to strains, are provided with large fillets.

The design of reciprocating parts, side and connecting rods, is much lighter than on our engines of the same size, resulting in much lighter counter balances in driving wheels and less severe strains on crank pins, which are also smaller than American practice would justify. Notwithstanding the lightness of these parts breakages are very rare. Broken piston rods are almost unknown and they are only replaced when worn too small. The following are the actual weights of the reciprocating parts of a common type of locomotive carrying 176.4 lbs. of steam, with cylinders 17 inches in diameter and 24.8 inches stroke.

1 piston	99.2 lbs.
1 " rod, about 1⅞ ins. diameter	62.2 "
2 " packing rings	14.8 "
1 crosshead	127.9 "
Total	304.1 lbs.

The extended smoke-box is but little used; nearly all locomotives have smoke boxes not exceeding in length 32 inches from the flue sheet. The nozzles are all single and placed high, being always above the center of the boiler. The choke form of the straight stack is used with no netting. A plate usually attached near the top of the exhaust pipe and sometimes perforated but which does not extend to either the front flue sheet sides or front of the smoke box, is used to interfere with the direct course of the sparks from the flues to the stack. Otherwise the smoke-box is entirely unobstructed, but so soft is the blast from the exhaust that very few sparks are thrown. On engines with 17-inch cylinders, 4¾ to 5¼ inches diameter of nozzle is usual, while many are run with even larger nozzles. The two-cylinder compounds usually have larger nozzles than simple engines of the same power, for example a 16.53 inch and 23.6 inch in diameter by 22.04 inch stroke compound on the Würtemberg State railroads is operated with a single nozzle 5.92 inches in diameter. The blower always consists of a circle of steam jets around the opening of the nozzle, a much better device than the single open pipe common here.

Many locomotives, especially in Prussia, are still equipped with the Carpenter air-brake apparatus, but all are being gradually changed to the Westinghouse, which will soon be in universal use on German lines. All engines are equipped with two injectors, which are almost always of the non-lifting type. Both throttle and reverse lever are operated by turning a crank instead of by the direct pull of a lever. The cabs are small, always of iron and afford much less shelter than those on American locomotives. Heretofore no seats were provided for either engineer or fireman, but on some of the more recent types on the Prussian roads not only is the cab closely modeled after American practice but it is also provided with comportable seats for both men.

The tender is carried on three axles set in plate frames. The top of the tank slopes gradually from back to front where it is about 12 inches from the level of the foot plate. The sides are straight and the same height front and back. This leaves ample room on top of the tank for the coal supply, which, on account of the sloping surface on which it rests, is all readily reached by the fireman. Table A gives the general dimensions, weights and principal data for some typical modern freight and passenger locomotives and those in most general use in some of the different countries forming the German Empire. This table is not complete but is fairly representative of present practice in these countries. Some Austrian locomotives are also given, as Austrian railroad methods differ so little from those in Germany that similar types of locomotives are fairly comparable.

The following data although relating entirely to the performance and maintenance of German locomotives and not to their design, is of interest. The analysis of the train mileage shows very clearly the large proportion of passenger train mileage. The freight traffic on the German lines is a much smaller proportion of the total traffic when expressed in train miles than the same traffic on the principal American lines, although, owing to the lower average passenger rates and higher average freight rates in Germany, the proportion of revenue derived from these two kinds of traffic differs but little from the corresponding proportion on American lines. The high average cost of German locomotives is surprising in view of their cheaper labor, and can be accounted for partly by the greater cost of copper over steel fire-boxes, but principally by the much less use of labor saving appliances and greater amount of labor expended in finishing parts by hand. The light average train load and small average mileage of locomotives compared with American practice are also very noticeable.

TABLE A.—GERMAN AND AUSTRIAN LOCOMOTIVES.

Kind of Locomotive.	Heating surface of firebox, sq. ft.	Heating surface of tubes, sq. ft.	Total heating surface, sq. ft.	Grate area, sq. ft.	Steam pressure, lbs. per sq. inch.	Number Tubes.	Diameter of tubes, inches.	Diameter of boiler, inches.	Diameter of cylinders, inches.	Stroke of piston, inches.	Diameter of drivers, inches.	Driving wheel base, feet and inches.	Total wheel base, feet and inches.	Weight on drivers, lbs.	Total weight of engine, lbs.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Prussian State R. R's:															
⅗ *Passenger Eng. Compound	80.52	1037.8	1118.3	20.11	176.4	197	.....	.50.39	H 16.54 L 24.8	22.83	68.05	.....	16- 4⅞	58870	86880
⅖ Exp. Passenger Eng. Compound	.....	.....	1345.5	24.54	176.4	.....	.....	.....	H 18.11 L 26.77	23.62	77.16	.....	.....	66300	99240
⅗ Passenger Eng. Simple	.....	.....	1011.8	22.28	176.4	.....	.....	.....	16.54	23.62	77.16	.....	.....	60420	87540
⅗ Freight Eng. Compound	87.16	1191.6	1278.7	16.47	176.4	180	.....	55.12	H 18.11 L 25.59	24.8	52.36	11- 1⅞	11- 1⅞	87480	87480
⅘ Freight Eng. Compound	115.75	1433.8	1549.5	24.76	176.4	235	.....	62.99	H 20.86 L 29.47	24.8	49.21	.....	20- 7	115980	128990
Saxony State Railroads															
⅖ Exp. Passenger Eng. Simple	.....	.....	1324	25.08	147	.....	.....	.....	17.32	23.62	73.82	.....	.....	61740	108930
Wurtberg State R.R's:															
⅗ Passenger Eng. Simple Cl.A	78.25	1054.7	1132.9	17.22	176.4	205	1.77	53.17	16.53	22.04	64.96	7- 8	13- 1½	58200	85780
⅗ Passenger Eng. Compound Cl. A	78.25	1054.7	1132.9	17.22	176.4	205	1.77	53.17	H 16.53 L 23.6	22.04	64.96	7- 8	13- 1½	59940	89080
⅖ Exp. Passenger Eng. Simple Cl.E	103.33	1490.4	1593.7	21.53	176.4	250	1.77	59.	16.53	22.04	64.96	7- 0	19- ½	60860	119500
⅗ Freight Eng. Compound Cl.Fc	83.96	1184.8	1268.7	15.06	176.4	205	1.77	53.17	H 18.9 L 26.97	24.09	48.42	10- 6	10- 6	71820	71820
⅗ Freight Eng. Compound Cl.F_2	66.09	1184.8	1250.9	15.06	205.7	205	1.77	53.17	H 18.9 L 26.97	24.09	54.33	16- 4	16- 4	91280	91280
⅗ Freight Eng. Simple Cl. F_2	83.96	1184.8	1268.7	15.06	176.4	205	1.77	53.17	17.72	24.09	48.42	9- 9	9- 9	83780	83780
⅘ H'vy Dec'd Fr't Eng Simple Cl.G	111.69	2015.6	2127.3	23.46	176.4	293	1.77	63.	18.9	24.09	48.42	19- 8¼	19- 8¼	151040	151040
Bavarian State R.R's:															
⅗ Passenger Eng. Simple B IX	.....	.....	906.4	.....	132.3	.....	.....	.....	15.51	24.01	.....	8- 3	14-	48510	73870
⅖ Exp. Passenger Eng. Simple BXI	.....	.....	1410.1	23.68	176.4	.....	.....	.....	16.91	24.01	73.23	7-10¾	21- 4	61740	109590
⅗ Freight Eng. Simple CIII	.....	.....	1356.5	.....	132.3	.....	.....	.....	16.93	24.01	49.33	10- 5	10- 5	75300	75300
⅗ Freight Eng. Compound CIV	.....	.....	1220.7	.....	191.1	.....	.....	.....	H 19.7 L 17.75	24.7	59.36	12- 6	12-6	87760	87760
Austrian State R. R's:															
⅖ Exp. Passenger Eng. Simple Cl. 4-5	85.25	1282.2	1367.5	22.17	161.7	186	2	52.36	17.13	24.8	71.26	8- 2½	19- 4¼	58430	98120
⅗ Freight Eng. Simple Cl. 56-57	86.11	1334.7	1420.9	19.37	161.7	186	2	53.17	17.72	24.88	50.71	10- 4⅜	10- 4⅜	91510	91510
⅗ Freight Eng. Compound Cl.59	92.57	1349.8	1442.4	19.48	176.4	188	2	53.17	H 19.68 L 29.1	24.88	50.78	10- 4	10- 4	92610	92610
⅘ Freight Eng. Simple Cl. 73-74	118.4	1837.5	1955.9	22.37	161.7	209	2	56.59	19.68	24.44	44.52	9- 6	9- 6	121280	121280
⅗ Br'nch line tank Eng Simple Cl. 97	46.82	589.	635.8	11.19	161 7	99	2	40.55	13.58	18.09	37.	8-10¼	8-10¼	66150	66150

* The fractions refer to the number of coupled axles and total axles under the engines. The numerator shows the number of coupled axles.

Performance and maintenance of locomotives on all Government Railroads of the German Empire; year 1891-92.

Total passenger Express train miles	22,049,903	
" " Accommodation train miles	82,750,043	
" Mixed train miles	22,514,504	
" Freight train miles	80,955,198	
" Work train miles	2,670,912	
Total	210,940,551	
Total mileage made by helping Engines	11,169,746	
Total train service	222,110,297	
Total of useful loco. miles in train service		222,110,297
Empty engine mileage	11,940,739	
Switching engine mileage at 6.2 miles per hour	103,415,392	
Total	115,356,131	
		115,356,131
Grand total all engines, miles		337,466,428
Number of locomotives on all lines	14,530	
Average number of locomotives out of service for repairs, etc., 17.73 per cent.	2,576	
Average number locomotives in service	11,954	
Average mileage per locomotive per year		23,210
" " " " " month		1,934
Total number of ton miles made by all locomotives in all kinds of train service, including weight of cars, locomotives, and tenders		61,143,100,127
Average ton miles per mile run by all engines in train service		275
Average cost of fuel per 100 locomotive miles		$6.36
" " all lubricating oils per locomotive per year		$64.00
Average cost of all lubricating oils per 100 locomotive miles		$0.316
Average cost of waste and cleaning and packing material per locomotive year		$33.00
Average cost of waste and cleaning and packing material per 100 locomotive miles		$0.163
Average cost of maintenance and repairs (all labor and material, but not including new locomotives replacing old,) per locomotive per year		$873.00
Average cost per 100 locomotive miles		$3.75
" of maintenance and repairs, wages, maintenance of coal and water stations, but not renewing entire locomotive, per 100 locomotive miles		$24.40
Average cost of each locomotive with tender		$10,844
" weight " " "		44 tons

Erosion of River Bank at Winthrop, Mo.

The larger diagram which appears with this article shows the condition, as it was on July 31, of the river bank at Winthrop, Mo., where the Missouri River has washed away its bank on the east side to such an extent that the village of Winthrop, a place of about 3,000 inhabitants, has been partially destroyed and is in danger of being completey wiped out. This village is on the east side of the Missouri River, opposite Atchison, Kan., and the tracks of four railroads were until recently located on the river bank as shown in the drawing, this being the main route of these roads by which they reach Atchison from the East. The roads are the Chicago, Rock Island & Pacific, the Atchison, Topeka & Santa Fé, the Kansas City, St. Joseph & Council Bluffs and the Hannibal and St. Joseph. The Kansas City, St. Joseph & Council Bluffs track was the only one left and the trains of the other roads ran over it; but by a press despatch of August 2, it appears that that also is now rendered impassable, and the approach to Atchison from the east is cut off. In anticipation of this complete stoppage the Kansas City road some time ago built a line from Rushville to Sugar Lake, 2¾ miles long along the Bluffs. This line has been used by through freight trains some weeks and will now have to be used

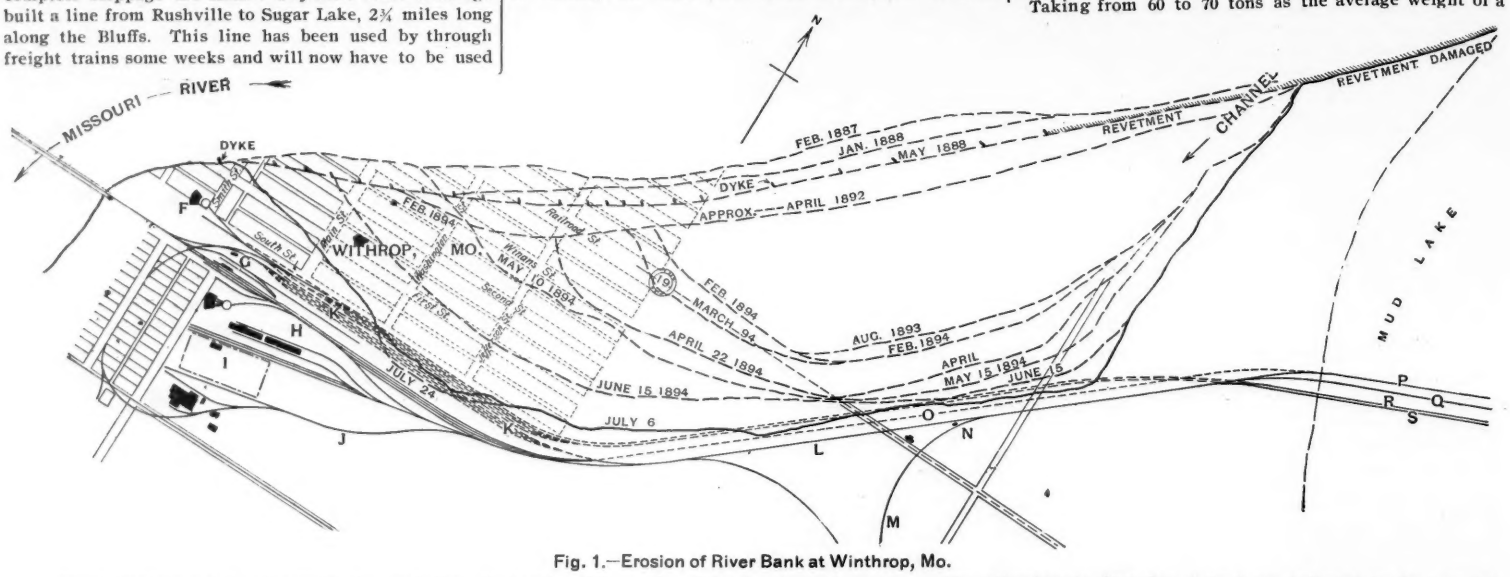


Fig. 1.—Erosion of River Bank at Winthrop, Mo.

NOTE: The letters *A B* on the small diagram indicate the location of the portion of the river bank shown above. The railroad tracks from *C* to *A*, fig. 2, are indicated in fig. 1, as follows: *P*, Hannibal & St. Joseph; *Q L*, Kansas City, St. Joseph & Council Bluffs; *R*, Atchison, Topeka & Santa Fe; *S*, Chicago, Rock Island & Pacific. *P*, *R* and *S* extended along the line *O* until a few months ago. *N* is Winthrop Junction Station; *M*, main line to Kansas City. Other references are: *F*, Rock Island engine house; *G*, Winthrop Station; *H*, H. & St. J. yards; *I*, Stockyards; *J*, H. & St. J. Property; *K*, Yard Tracks recently abandoned. The broken lines indicate the extent of erosion at different dates.

or all the traffic between St. Joseph and Kansas City. Chief Engineer Goodale of the Kansas City, St. Joseph & Council Bluffs, from whom we received the diagram, thinks that the river is likely to cut the bank throughout the summer, as the main force of the current at Winthrop Junction now strikes the bank nearly at right angles.

In 1888 and 1889 the United States Government spent about $150,000 on work designed to protect the eastern shore from the bridge northward to Mud Lake, a short distance above Winthrop Junction. This work is now all swept away and most of the material that was put in is now on the Kansas side of the river.

There is an appropriation of $35,000 now available for work near Atchison, but it is a question whether the money can be spent for any useful purpose. It is within the range of possibility that the river will cut a channel directly across from Mud Lake to Sugar Lake, in which case the costly bridge at Atchison would be left without any reason for existence.

Since the present rise in the river began, the east bank has been washed away about 900 feet and during the past

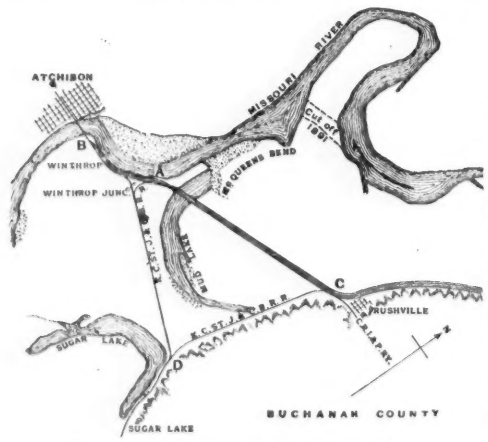


Fig. 2.—Missouri River at Winthrop, Mo.

year the total inroads aggregated 2,300 feet. Fully two-thirds of the dwellings and business houses in Winthrop have been torn down or moved away to save them. The railroads have spent nearly $30,000 this year in attempting to protect the banks on which the tracks lay, but with no satisfactory results. The St. Louis *Globe Democrat* of July 22 published a long list of the names of property owners whose lands have been practically annihilated.

Press despatches state that the bridge company will now take vigorous measures to protect the foundations and approaches of the bridge.

Mannesmann Tubes and Flasks at the Antwerp Exhibition.

We translate from the *Cologne Gazette* the following notes from its special correspondence from the Antwerp International Exposition.

An important exhibition is that of the Mannesmann Tube Works, of Düsseldorf. Fine examples are shown of their work, including also products of their other works at Remscheid, Bous-on-the-Saar and Komotan in Bohemia. There is a forest of slender tubes and rods, not special exhibition products, but specimens which the several establishments of the company collected and offered shortly before the opening of the exhibition, to take the place in some degree of the expected but unfortunately delayed exhibits of the works from the Chicago's World Fair. The tubes and various products are the well-known seamless steel work of the Mannesmann method.

There are tubes for locomotive, marine and other tubular boilers, tubes for steam, hydraulic, gas and air transmission, tubes for deep well boring, etc. The possibility of turning out these steel tubes in one piece, in great lengths, and of uniform or varying diameters, makes them specially applicable as posts. Some of the telegraph poles and masts, ranging in length up to about 36 feet, made in one piece (some are of two pieces, coupled), attract special attention. Some of the steel tubes shown are intended for bicycle frames, and have, to a great extent, crowded out English products designed for the same purpose. The Mannesmann tubes either have less thickness, and are, therefore, lighter, or, with the same thickness, have greater strength.

The most important output of the works, however, is found in the carbonic acid gas reservoirs and reservoirs generally for storing and transporting compressed gases. It is only during the past few years that the compressed and liquefied gas industry has attained prominence, and its rapid development has been almost wholly due to the metallurgical progress which made suitable reservoirs possible for holding and transporting them. At the outset only welded wrought iron flasks were available. These, capable of holding about 10 kg. (22 lbs.) of liquid carbonic acid, weighed, themselves, from 40 to 45 kg. (88 to 99 lbs.) each. The Mannesmann process has made it possible to greatly reduce these weights, and, at the same time, has contributed to greater safety, which is of great importance. Cold drawn receivers, without seams, are, it is true, made in other countries as well as in Germany, by processes other than the Mannesmann; but disastrous accidents with such cold drawn and pressed receivers have occurred, the resistance of the receivers in a longitudinal direction, as compared with their cross sectional strength, being much reduced by the drawing process. In the Mannesmann steel flasks this danger is avoided, the metal being worked hot. Comparative tests have shown that the Mannesmann flasks will sustain double the strain that cold drawn receivers will bear before permanent distortion will be produced. This greater strength guards against accidental bursting of the reservoirs, and when they are tested to destruction, their uniform resistance, both longitudinally and transversely, has the effect of making the rupture comparatively harmless without the usual scattering about of fragments.

During a fire at the Shneidemuhl railroad station, when a number of cars carrying Mannesmann flasks filled with carbonic acid were burnt, no damage was done by bursting of flasks. In the greater number of flasks the great heat caused the cocks to leak so that the gas could escape before dangerous pressures were produced. Only one of the flasks was destroyed and this one simply burst without going to pieces. Mannesmann flasks containing normal charges of compressed gas, have been dropped on steel rails and anvil blocks from heights of as much as six and seven meters without sustaining greater damage than a few bruises. Two flasks tested in this way are on exhibition here.

A number of interesting products of the Mannesmann process, the correspondent has failed to mention. Light trolley poles, made of one piece, are manufactured to a large extent, and an exhibit of these is shown at the New York office, 1 Broadway, together with ammonia cylinders, hollow axles, army material and the articles mentioned in the description.

Experience in the Construction and Working of Narrow-Gage Railroads.

The trials which for a number of years have been made by the Prussian Railroad Administration in the construction and working of narrow-gage lines of 60 centimetres (=1 foot 11½ inches), have proved the efficiency and safety of these lines for passenger as well as for goods traffic. These lines are also largely used for military purposes, where speedy construction and the greatest simplicity and lightness of materials are the important factors, and have proved themselves perfectly adequate.

The smallest admissible radius for the main line curves is 98 feet; sharper curves would necessitate a more complicated construction of the locomotives. The wheel-bases of the wagons are so dimensioned that curves up to 33 feet radius can be traversed; this enables sidings to be readily and economically laid to agricultural and industrial establishments.

Taking from 60 to 70 tons as the average weight of a train, including the locomotive, the following statistics are given for the laying out of the lines. One in 50 should if possible be the steepest gradient allowed; gradients steeper than 1 in 40 are not favorable to a regular and profitable working. With regard to gradients between 1 in 40 and 1 in 50, they should have, if longer than from 1,300 to 1,600 feet, horizontal stretches before them of at least double the distance. Curves under 650 feet radius should be avoided in gradients steeper than 1 in 60.

With regard to the permanent way materials, the following statistics are given: the rails should weigh at least 19 lbs. per yard; for this weight a rail 2¾ inches in height with a strong head and wide base is the most favourable. Uhe distance betewen the sleepers should be from 2 feet 1½ inch to 2 feet 4½ inches, the breadth of the sleepers from 5½ to 6¼ inches, and their length should not be under 4 feet. The fish-joint should be strong and durable, either flat or angular fish plates with 4 bolts and suspended joints being used. The most suitable length of the rail is 16 feet.

The locomotives, constructed at the works of Messrs. Krauss & Co. at Munich, have given satisfaction and combine great flexibility with easy running, and, on account of the low position of the center of gravity, have proved themselves especially adaptable to the sharpest curves and steepest gradients. The boilers of the locomotives are tested to 300 lbs. per square inch, the highest steam pressure allowed in practice being 225 lbs. per square inch. The weight of the locomotive with coal, water, etc., amounts to 14 tons 14 cwt. The traction efficiency has been found as follows:—

		Tons.
1.	On lines with gradients up to 1:100	108 to 117
2.	" " " 1:50	59 " 69
3.	" " " 1:40	49 " 54
4.	" " " 1:30	34 " 39
5.	" " " 1:25	27½ " 29½

The consumption of coal per locomotive per hour amounts to from 275 lbs. to 440 lbs., and of water from 132 gallons to 198 gallons, according to the train-loads, the speed, and the gradients. The locomotives can run with water and coal carried in their own tanks sufficient for 2½ hours' consumption, rendering tenders unnecessary.

The average speed attained is 9½ miles per hour, but on lines specially well laid out this is increased considerably. The locomotives are fitted with pumps, so that elevated water-tanks are unnecessary, and water can be drawn from low-lying tanks or natural water courses.

The wagons are so constructed that the upper frame or box can easily be taken off the eight-wheeled under-frame, and the under-frame or wagon can then be employed for the transport of long timber, girders, etc. The boxes have a carrying capacity of 5 tons, and their cubical content is 222 cubic feet. The wagons are fitted with central buffers of cylindrical form, well-made axles without springs, single flanged wheels, upright spindle brakes with brake-blocks placed behind the wheel, and journals which can be well lubricated. By these contrivances the cost of the wagons is increased, but, on the other hand, they ensure easy running and by that means diminish the train-resistance, the consumption of coal, etc. The average wheel-diameter is 17½ inches and the wheel-base 2 feet 3½ inches.

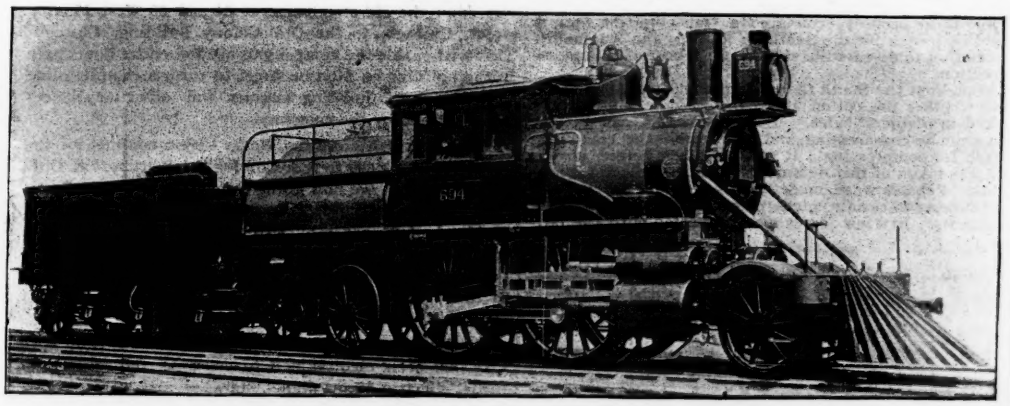
The question whether a single or double-flanged wheel is best for the locomotives was decided in favor of the former.

The possibility and safety of passenger traffic on the 1 foot 11½ inches gauge has been proved by practical experience. The car is constructed after the style of a tramway-car, with longitudinal seating for twenty persons; it rests upon two bogies with springs, and runs throughout lightly and easily.—*Abstracts of Papers, Inst. C. E.*

Compound Engines for Heavy, Fast Trains.

The accompanying illustration shows the general appearance of a compound engine built by the Baldwin Locomotive Works for fast passenger service on the Philadelphia & Reading Railroad, and exhibited last year at the World's Fair.

We gave in our issue of April 13 an account of a test made on the Atlantic City line of the Philadephia & Reading between this engine and single expansion engine No. 1016 to determine which of the two classes was the more economical in high speed passenger service, whether buckwheat or pea coal could be satisfactorily burned in either, and whether either one would show a marked superiority over the other in any respect.



Fast Baldwin Compound Locomotive with Wootten Firebox.

The showing made was decidedly in favor of the compound engine either with egg or pea coal. Neither engine made a satisfactory showing with buckwheat coal and it was found necessary, with engine No. 1016, to use some lump with the pea coal in order to do good work.

Data just received show that engine No. 694 is capable of making excellent time with heavy trains. The schedule of the runs made by this engine on June 16 and 23, 1894, from Camden to Atlantic City, a distance of 55.5 miles, shows that on the first date mentioned the average speed from start to stop was 55.04 miles an hour with a train of ten cars consisting of seven ordinary and three drawing room cars. On the 23d, with a train of seven day coaches and four Pullmans, the average speed was 54.36 miles an hour. The time on the road was materially increased in each case by a delay at the crossing of the West Jersey Railroad, in Camden, the trains having to almost stop; they were running about three miles an hour when the clear signal was given. This crossing is at the foot of an ascending grade of 0.5 per cent. Taken from this point the run of 54 miles was made each day in 55 minutes, or at the rate of 58.9 miles an hour.

On July 7, engine No. 694 hauled this train with three coaches and five Pullmans from Camden to Atlantic City in 57 minutes, or at an average speed of 57.9 miles an hour. The highest test speed recorded was 75 miles an hour and a speed of over 63 miles an hour was maintained for 35 miles. The train was heavily loaded and weighed 366 tons.

On July 14, with the same number of cars and the same load, the run was made in 57 minutes and 30 seconds, an average speed of 57 4 miles an hour. The maximum speed in this case did not exceed 72 miles an hour. As on the run of the 7th, a speed of 63 miles an hour or over was maintained for 35 miles.

Rowell-Potter Automatic Signals on the Chicago & South Side.

It has been mentioned in the columns of the *Railroad Gazette* that the Rowell-Potter Safety Stop Company was placing its safety stop blocking system on the "Alley" railroad of Chicago. All the stations have now been equipped and the apparatus is in working order and giving good satisfaction to the railroad company and the Rowell-Potter Company. In the *Railroad Gazette* of Oct. 6, 1893, was given an illustrated description of the signaling system with which the Intramural road at the World's Fair was equipped by the same company. The Intramural road was blocked throughout its entire length with continuous blocks, and the signals were cleared by an electric current; on the Alley road the entire operation is mechanical. The illustrations given with this are of such principal parts as differ essentially from those illustrated in the article mentioned.

The general arrangement at each station for one track is shown in Fig. 1. The semaphore and safety stop is located 630 ft. back of the "location signal," where engines stop, and about 60 ft. back of these is the operating trip. The operating trip is an incline placed near the rail. This is connected by means of a bell crank to the pipe line which extends to the release trip and the signal trip. When the operating trip is depressed, as when a locomotive runs over it, the release trip is elevated above the rail and the releasing bar is withdrawn from contact with the latch so that the latter may operate when the locomotive passes over the signal trip.

Beyond the operating trip is the semaphore and safety stop; if the semaphore is in the all-clear position the safety stop will be found depressed and the train can pass without stopping; if the signal is at danger, the air brakes are applied by the safety stop. The safety stop and the equipment on the locomotive are the same as those used on the Intramural road. Beyond the semaphore are located the signal trip, shown in detail in Fig. 2, and the latch, shown in Fig. 3. Referring to Fig. 2: The incline of the signal trip is connected with a lever that is at right angles to the track rails; at the outer end of the lever is a heavy weight, when the incline is in the position shown, the weight of the lever acts against the lighter weight of the semaphore and the signal is held in the all clear position. A locomotive passing over the incline depresses it and removes the lever weight from contact with the signal pipe line; this allows the semaphore weight to bring the signal to the danger position. When the incline of the signal trip is depressed, the outer end of the lever throws up the rack shown in Fig. 3, and the dog and latch engage with each other and the rack to hold up the lever weight till the signal is again cleared.

The primary and secondary safety stops and semaphore are so connected by means of the signal pipe line that when the semaphore is at clear the primary is depressed so as not to engage the air-brake apparatus on the locomotive, but the secondary is elevated. Should a locomotive pass over the signal trip and the semaphore not be thrown to the danger position, the secondary safety stop will apply the air-brakes. If the signal operates properly, the primary safety stop is elevated, the secondary is depressed and the train passes without delay. The secondary stop is provided so that if from any cause the signal does not go to danger when a locomotive is passing, the air-brakes will be applied and the engineer thus notified that his train is not protected by the signal. Before the train can proceed the air valve that has been opened by the secondary safety stop must be closed and the brakes released.

When the locomotive has moved 330 feet beyond the station stop it runs over the release trip and depresses it, the operating trip is elevated by means of the pipe line connecting the two, and the latching device is disengaged; the latter operation allows the lever weight to fall, and, overcoming the semaphore weight, it throws the signal to the clear position. By the same operation the signal trip is elevated, the primary safety stop is depressed and the secondary safety stop is elevated.

During the heavy fogs of last winter a locomotive ran into the rear end of a train that was standing at a station, and the Rowell-Potter apparatus has been put in to prevent a repetition of the accident The operation of the system is entirely mechanical and compels an absolute stop of the train when the signal is at danger or the mechanism is out of order. The signals have not been in operation long enough for any records to be given, but there can be but little doubt that time will prove it satisfactory. With the present train service there are 15,096 operations in twenty-four hours.

Interlocking.

The National Switch & Signal Co. has recently completed the interlocking plant at Colton, Cal., for the Southern California Railroad. This company has also finished the changes in the 80-lever interlocking plant at Forty-third street, Chicago, for the Illinois Central Railroad. These changes provide for the use of track No. 8 by the fast suburban service, and are part of a series of changes now being made by the Illinois Central with a view to increasing the efficiency of the Chicago suburban traffic.

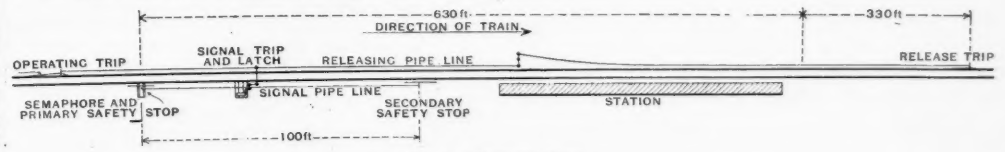


Fig. 1.—General Plan.

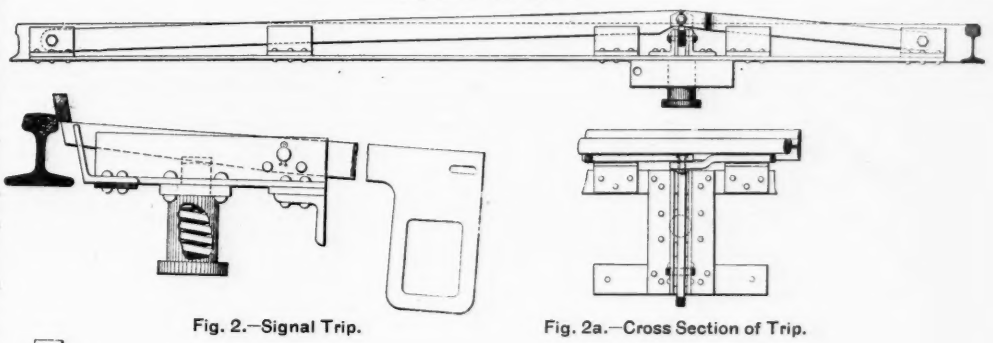


Fig. 2.—Signal Trip.

Fig. 2a.—Cross Section of Trip.

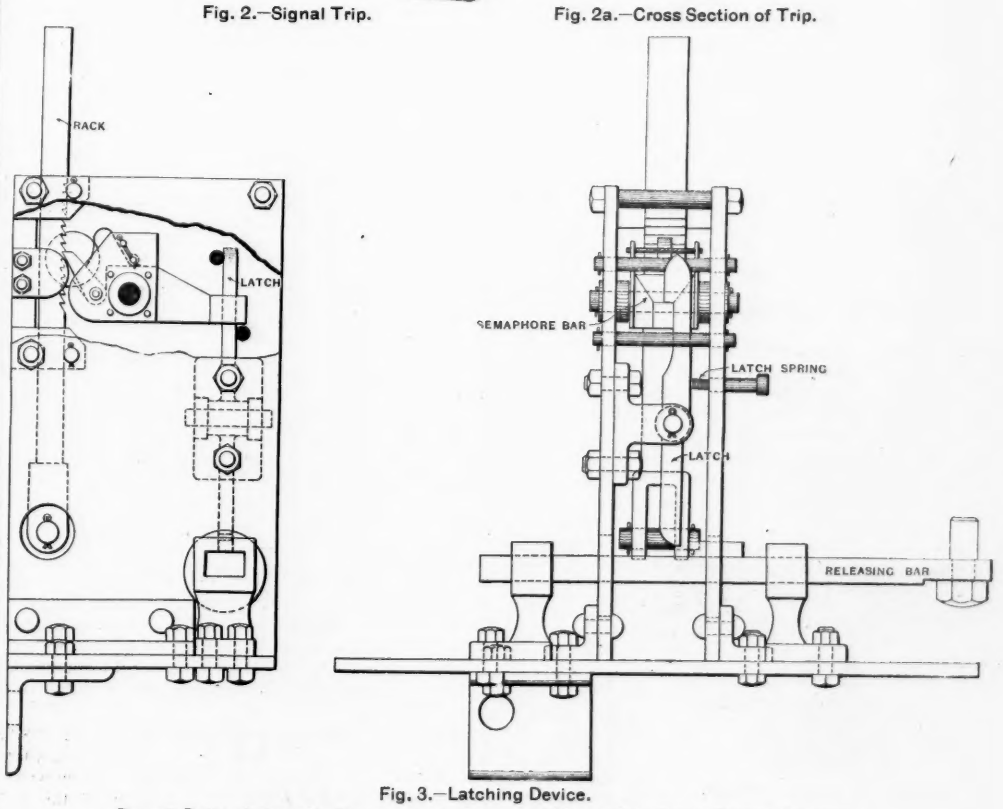


Fig. 3.—Latching Device.

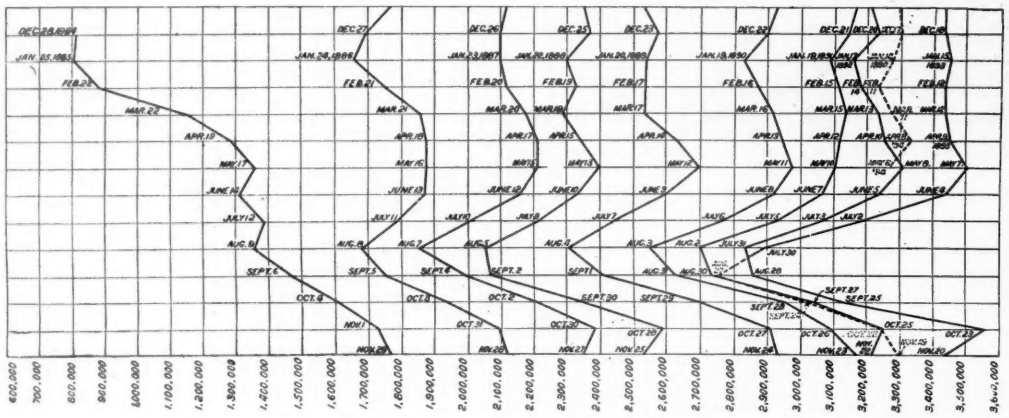
Rowell-Potter Automatic Signals on the Chicago & South Side Rapid Transit Railroad.

Traffic on the New York & Brooklyn Bridge Railroad.

The following is a comparative statement of the number of passengers carried by the New York and Brooklyn Bridge Railroad from January, 1891, to the end of May, 1894:

	1891.	1892.	1893.	1894.
January	3,392,425	3,438,489	3,797,314	3,597,092
February	3,156,445	3,369,903	3,446,794	3,210,733
March	3,462,686	3,548,962	3,783,446	3,708,002
April	3,333,193	3,567,562	3,766,273	3,524,358
May	3,428,892	3,620,045	3,846,493	3,537,534
June	3,200,844	3,320,535	3,438,475	....
July	2,987,811	3,137,673	3,190,931	....
August	3,022,864	3,161,813	3,040,491	....
September	3,261,703	3,388,995	3,278,621	....
October	3,623,016	4,033,920	3,644,053	....
November	3,429,686	3,594,361	3,532,543	....
December	3,590,640	3,849,671	3,658,430	....
Total	39,890,205	42,031,929	42,423,864	....

In the second table appears the increase in the number and in per cent. In this latter table we have omitted the last three figures of each number, making one equal one thousand.



Railroad Passengers on the New York & Brooklyn Bridge.

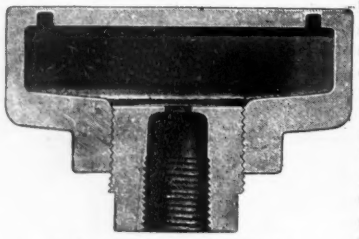
	1891.		1892.		1893.		1894.	
	Inc.	P. c.	Inc.	P. c.	Inc*.	P. c.	Inc*.	P. c.
January	295	8.7	46	1.3	359	9 5	200	-5.6
February	230	7.3	214	6.3	77	2.2	236	-7.4
March	238	6.9	86	2.4	234	6.2	75	-2.0
April	131	3.9	234	6.6	199	5.3	242	-6.9
May	154	4.5	191	5.3	226	5.9	309	-8.7
June	179	5.6	120	3.6	118	3.4	.....	.....
July	177	5.9	150	4.8	53	1.7	.....	.....
August	117	3.9	134	4.4	-121	-4.0	.....	.....
September	96	3.0	127	3.8	-110	-3.4	.....	.....
October	192	5.3	411	10.2	-390	-10.7	.....	.....
November	24	0.7	165	4.6	-62	-1.7	.....	.....
December	124	3.4	259	6.7	-191	-5.2	.....	.....
Total	1,957	4.9	2,142	5.1	392	0.9	.....	.....

* The minus sign indicates decrease.

To better illustrate the regular periods of increase and decrease, we print the accompanying diagram. It will be noticed that travel is heaviest during the months of May and October and lightest through February and August. The heavy increase in October, 1892, was due to the Columbus celebration on the four hundredth anniversary of the discovery of America. The dotted lines indicate rise and fall of traffic during the past year. This great falling off may be attributed largely, but not wholly, to the hard times. The introduction of electric street cars in Brooklyn has somewhat influenced this decrease, as the various ferries can now be reached in less time than was formerly occupied in going to the bridge. To many persons who travel between Brooklyn and New York the ferries (especially Fulton Ferry) are as convenient as the Bridge. These two facts, combined with the difference in fare across the river, tend to seriously affect Bridge traffic.

The Baker Jointless Safety Vent.

Mr. William C. Baker, who is constantly on the alert to make his car heater the most perfect apparatus of the kind, has made an improvement in the safety vent, which is illustrated in the accompanying drawing. As is already familiar to those who use the Baker heater, this apparatus is made water tight and is designed to be used continuously without renewal of the water. There is, therefore, no safety valve, and when properly cared for no escape of steam; but carelessness must be guarded against, of course, and this "safety vent" is attached to the drum for that purpose. It is made of cast iron, and is enough thinner than the drum itself to burst before the pressure gets high enough to do any damage. The improvement now made consists in making the frangible disk perfectly flat, so that it will be sure to break before it will bulge, and in the cutting of the narrow groove around the outer edge of the disk so as to insure a uniform thickness of metal at the thinnest part and thus make the breaking pressure more nearly uniform. By testing it has been found that the castings can be made to break very nearly at 500 pounds, gage pressure, every time.



Safety Vent for Baker Heater.

The Cost of Compressing Cotton.

This is an era of economy in transportation and it would be proper for the Southern Railway and Steamship Association to discuss the subject of the cost of compressing cotton.

Throughout the South the rates quoted on cotton are the same whether the cotton is compressed or but loosely packed in planters' bales. But more bales can be got into a car by compressing, and hence arose the custom of paying for compressing. It was not long before advantage was taken of this outside payment to influence shipments. Rebates were made for more than the cost of compressing to certain press owners who could control shipments. In a few cases men connected with the railways, or owners of their securities, put up presses with the intent to reap illegitimate profits from their own companies. Of late years the charge paid for compressing cotton has become an intolerable burden. Payments have averaged fifty cents a bale. If we say roughly that the crop consists of 8,000,000 bales, and that 2,000,000 bales reach the seaports by river, we shall not be far out of the way in assuming that all the Southern railroads pay out annually something like $3,000,000 for this purpose alone. The Southern Association estimates the expense to its own members at $2,300,000 annually.

A freight car will hold 30 bales of "flat" cotton or 50 bales of compressed. If we allow for the car mileage thus saved at ¾ cent per mile run, and if we further assume that the average train consists of 25 cars costing 50 cents per train mile, we may easily calculate that the theoretical saving is equal to the charge for compressing (50 cents a bale) whenever the cotton compress is 700 miles from the port. And this calculation leaves out the loss in hauling the empty cars back, which if taken into account would require a haul of 1,000 miles before the railroad could come out even. In the light of these few figures a company which is hauling cotton but 200 or 300 miles, and at the same time paying 50 cents a bale for compressing, is losing money heavily.

But the charge of 50 cents a bale includes a rebate, for the cost of compressing is only 25 cents if done on a large scale; and this cost a railway, according to our calculations just given, could afford to pay if it hauled the cotton 350 miles, otherwise not. The conclusion of a committee appointed last fall is: "Where this rail haul does not exceed 400 miles the advantage (of compressing) is very slight, being largely offset by the time lost in unloading the uncompressed cotton at the press and again loading it for shipment, and by the serious dangers and loss of revenue attending substitution." If, therefore, cotton is hauled 400 miles and if the charge is reduced to 25 cents a bale, the railroads will gain nothing. If, as is the case generally, the haul is less than 400 miles and the charges paid average 50 cents, the total loss to the Southern railways will reach $1,500,000 or more annually.

An evil of such long standing cannot be checked in a day and probably not until some form of pooling is adopted by the roads. Meanwhile, it may be advisable for the Southern railways to own all the compresses, so that if the practice must be continued it shall be conducted at the minimum of expense and without the element of rebating. This could be carried out if all would join. But in the end, since the steamships demand compressing, and since compressed bales are worth 50 cents more at the ports, the practice of paying for compressing, so far as railroads are concerned, should be abolished altogether. If necessary, it would be better to readjust all cotton rates to the new basis. The trade benefits are to the presses profits enough.

. . . No means should be left untried to save this constant loss. The railway managers will not be doing their duty if they pass the subject by. Nor will owners of bonds and shares of Southern railways consent to have their officers and directors shut their eyes to this constant and wrongful depletion of their treasuries.—*Evening Post*, New York.

TECHNICAL.

Manufacturing and Business.

Upon the adoption of the Pintsch light by the Big Four and the Michigan Central Railroads it became necessary to erect Pintsch plants in Cleveland and Detroit, so that all of the cars passing over those lines could be supplied. These plants have just been completed and are now delivering gas daily.

The Boston & Montana Consolidated Copper and Silver Mining Co. of Great Falls, Mont., is installing a larger rope drive for the transmission of power, which will use more than 2¼ miles of "Stevedore" rope of the C. W. Hunt Company's manufacture.

The Lehigh Valley is so well satisfied with the good working of the automatic block signals lately installed by the Hall Signal Co. that it has given the Hall Co. a contract for their extension.

The Johnson Railroad Signal Co. has received an order for the construction of interlocking signals and switches in the St. Louis yard of the Missouri Pacific. We understand that this is the first interlocking ever ordered by that road.

The Lidgerwood Mfg. Co. has removed its office quarters from the old storehouse at 34 and 36 West Monroe street, Chicago, to the Old Colony Building, Chicago. This will enable the company to use the entire floor space in the building on Monroe street to carry a complete line of cable ways, hoisting engines and other appliances manufactured by the company.

The South Baltimore Car Works have a contract for the repair of over 1,000 freight cars for the Baltimore & Ohio Railroad which are now going through the plant at Curtis Bay. Receiver Charles T. Crane states that an additional dividend of 25 per cent. will probably be paid to the creditors during October. Already two dividends of 25 per cent. have been paid by the receivers, and they expect to turn the property over to the stockholders by next January.

The New York Standard Construction Co., of New York City, has been incorporated to construct and equip railroads, electric light plants, subways and water works. The directors are: Eugene Berry, of Rutherford, N. J.; Richard Krouse, Santiago Ping and Mark Sugarman, of Brooklyn, and William T. Zandt, of New York City.

Work has been resumed in all departments of the McKeesport mill of the National Tube Works Co., and the company has a good supply of orders on hand. The outlook for new business is very satisfactory.

The Ajax Metal Co., of Philadelphia, issues a circular announcing that the well known journal-bearing metal, Ajax white metal alloy, will be called hereafter Ajax tin. An important reduction will be made in the price, which will be fixed to meet the net cost of copper and tin. The company announces that with its large plant it is prepared to make castings of all sizes and will make yearly contracts with railroads for their entire supply of bearings of every description.

The oil cup that was designed by Mr. G. B. Hazlehurst and Mr. F. J. Cole, General Superintendent of Motive Power and Mechanical Engineer, respectively, of the Baltimore & Ohio Railroad, for use on locomotive main and side rods, and which was illustrated in the *Railroad Gazette* May 11, is being manufactured and offered for sale by a Baltimore company. Mr. F. J. Cole, 1605 John street, Batimore, Md., will give all information concerning the cup.

New Stations and Shops.

The Chicago & Eastern Illinois is reported to have ordered its shops at Brazil, Ind., torn down and removed to Momence, Ill., because the city refused the company protection during the strike.

Compressed Air Street Cars in Paris.

In a paper recently read before the French Society of Civil Engineers, M. Chatard presented data concerning the compressed air street car traction system now being installed by the Compagnie Générale des Omnibus de Paris on three of its most important lines, namely that running from the Louvre to St. Cloud, a distance of about 6½ miles, that from the Louvre to Sèvres and Versailles, about 12 miles long; and that from Vincennes to St. Augustin, about 6 miles long. In the case of the first two lines trains of three cars each will be hauled by compressed air locomotives, while in the other motor cars will be used to which, when the volume of traffic requires it, a trailer can be added. For the first mentioned lines there will be one main power station supplying compressed air to two locomotive charging stations through 2½-inch pipe line. The charging stations are about 1⅓ and 2½ miles distant, respectively, from the power station. The latter is equipped with seven air compressors and a battery of eight boilers, besides an air accumulator outfit. The system to be followed is that of Mekarski which has been in successful operation on the Nantes lines for the past 15 years. The Vincennes-St. Augustin line will have two power stations at different points along its length, one containing three compressors and the other four. All three lines are expected to be in operation before the end of August.

Chain's Air Brake Spring Compressor.

In our issue of Jan. 26 last appeared an illustration and description of a device patented by Mr. Elmer E. Chain for compressing brake release springs in air brake cylinders and also of a piston packing form. These devices are now controlled by the Westinghouse Air Brake Co.

Anti-Rust Grease.

Anti-Rust Grease is the name applied to a substance which, used as a coating, is recommended for the prevention of rust and the protection of the bright parts of machinery. It is said to be extensively used and particularly valuable for the prevention of rust, stain or scratch to machinery in course of construction or in shipment, taking the place of the mixture of white lead and tallow, or of the various petroleum products frequently used for such purposes. As a point of superiority over the white lead and tallow mixture it is said that anti-rust grease never dries hard but can be readily removed with cotton waste without the use of oils, benzine or scraping, while in applying no special method is necessary. The ingredients

of this subtance and its preparation are not made public but it has been in successful use in Great Britain for seven years and is claimed to be perfectly free from acid or alkali. The manufacturer refers to railroad corporations, locomotive builders, bridge builders and others who are now using the product, and states his willingness to ship the same for trial if desired. Being economical in application (a little goes a great way) it is said to be very much cheaper in the long run than anything now used. Anti-rust grease is manufactured and sold by F. H. Melville, 55 North Moore street, New York.

New Dining Cars on the Great Northern of England.

Engineering of July 20 publishes a brief description of two new third-class dining-cars lately completed to run on the East Coast Line between London and Edinburgh. These cars were built at the company's shops at Doncaster from designs of Mr. Patrick Stirling, locomotive superintendent. They are 52 ft. 6 in. long and 9 ft. wide. To get a wide body and at the same time avoid the platforms at stations the cars are barreled considerably; that is, the sides are curved instead of vertical. The cars are made of teak and have two four-wheel trucks. The representative of *Engineering* finds that they run very smoothly at sixty miles an hour, even when not loaded, and he thinks that the springs have been very nicely adjusted; in fact that the builders have come well up to the American standard in this respect, which he says is high. Each car seats 42 passengers, three sitting abreast, two on one side of the aisle and one on the other. The Gold heating apparatus is used and compressed oil gas is used for lighting. The principal woodwork in the interior is varnished teak and the panels are either polished sycamore or plate glass.

Gas Engines.

A very good illustration of the growth of the gas engine industry in Germany is afforded by the recently published statement that in 1871 there were in operation in that country about 18,000 motors of this type, with a combined horse-power placed at about 60,000, giving an average per engine of 3⅓ horse-power. Since 1891 the number of motors in use has been increased considerably, though in the absence of official statistics it is impossible to give a definite figure. Judging from the sales of two of the principal German gas engine makers, however, it would seem within the mark to place the number now in operation at 25,000.

Power House for Baltimore Tunnel.

Excavations are now being made at Baltimore for the power-house to be used in operating the Belt Railroad. It will be a one-story brick building. It will have a front of 339 feet on Howard street, 69 feet on Henrietta street, and 58 feet on Montgomery street. The boiler-room will be 98 feet long and 69 feet wide, and will be fitted with automatic conveyers for coal. The machinery room will be 240 feet long and 58 feet wide. The equipment of the building will include eleven 250-h. p. boilers, with a fifty-foot smokestack and mechanical draught.

The engine room will contain four 750-h. p. Corliss compound engines coupled direct to four 700-h. p. multiple generators, which will furnish the electric power for locomotives and also for lighting the tunnel. In addition there will be four 250-h. p. Armington & Sims compound engines, two of which will drive eight 50-arc-light machines, each light having 2,000 candle power. These lights will be used at Mount Clare, Locust Point and Camden Station. Each of the remaining two engines will be used to drive two generators capable of lighting 2,000 sixteen-candle-power incandescent lamps for use in the new depot at Bolton lot and other places along the line. Provision will also be made for an extra 700-h. p. generator.

It is said that the motive power for the tunnel trains will consist of three locomotives having two trucks each, each truck to be equipped with two 300-h. p. electric motors. The power-house was designed by Baldwin & Pennington. The electrical equipment was designed by the General Electric Company, and is being made at the company's shops at Schenectady, N. Y.

The Philadelphia Ship Canal.

In pursuance of an ordinance of the city councils, approved July 2nd, Mayor Stuart, of Philadelphia, has appointed a Canal Commission of eleven gentlemen, including himself, "whose duties shall be to organize, supervise and direct surveys and examinations of the route of the proposed ship canal between the waters of the Delaware River and the Atlantic Ocean, and make a report thereon to the mayor, to be by him transmitted to councils, with such recommendations as the said commission may be pleased to make." The commission is composed as follows: Messrs. Edwin S. J. Stuart, Mayor, Daniel Baugh, Edwin S. Cramp, Hamilton Disston, W. W. Foulkrod, George W. Kendrick, Jr., Thomas Martindale, Edward Morrell, L. Y. Schermerhorn, Elias P. Smithers, John Wanamaker. The ordinance of councils creating the commission appropriates $10,000 to pay for the expenses of the surveys and examinations ordered. The commission has appointed an executive committee of five, to consider the routes proposed and to select from them such as they deem worthy of further examination. Upon the acceptance of the committees' report by the commission, the surveys will be begun by the engineer of the commission, who will be recommended to the commission by the Executive Committee and confirmed by the commission if approved. The members of the Executive Committee are Messrs. Baugh, Cramp, Kendrick, Martindale and Schermerhorn.

The Lubrication of Pulley Blocks.

In a recent series of efficiency tests of hoisting tackle made at the Brooklyn Navy Yard not long ago, some interesting conclusions were reached. The tests were mainly for the purpose of determining the power wasted by unlubricated blocks. A two-sheave tackle, which had been lying for a long time, the bearing surfaces being dry and dirty, was procured and tested by slowly hoisting weights by man power applied through a compound tackle, the effort expended being measured by a spring balance. The same tests were made with bearings cleaned but not lubricated and repeated after they had been lubricated. The tackle was of the form generally used in the navy, the upper block having roller bushings for the sheaves, and the lower one having plain brass fixtures. The efficiency of the tackle, when well lubricated with graphite grease, ranged from 77 to 80 per cent., the efficiency being greater as the weight was increased. This increase in efficiency seems to have been wholly due to the decrease in the weight of the lower block, as compared with the weight lifted, as by taking the block into account the efficiency is practically the same for all tests recorded, or 82.3 per cent. as compared with lubricated blocks, the blocks cleaned but dry show a loss of 8.5 per cent., while dry and dirty blocks show a loss of 21 per cent. The difference between the clean and dry blocks and the lubricated blocks would, of course, have been greater if the upper sheave had been provided with a plain bearing like that of the lower one, as the friction of the bearing when dry would have increased. It is probable, however, that the friction of a dry and dirty roller bearing would be as great as that of a plain bearing.

THE SCRAP HEAP.

Notes.

The South Dakota Board of Equalization has increased the tax assessment on sleeping cars 33⅓ per cent.

The coal operators of Western Pennsylvania who ship by rail have formed an organization under the name of the Pittsburgh Association of Railroad Coal Operators.

A train left Portland over the track of the Oregon Railway & Navigation Co. on August 3 for the first time since June 24, when the flood in the Columbia river destroyed the road bed for many miles.

The Toledo, St. Louis & Kansas City is building a new grain elevator at Swan Creek, Toledo, with a capacity of 200,000 bushels. The building is of iron and is now practically ready for the storage of wheat.

It is reported from Kansas City that the Chicago Great Western has concluded negotiations with the Suburban Belt Railroad, and that an agreement has been signed whereby the trains of the former will enter Kansas City, over the tracks of the Belt Line and use the station at Second and Wyandotte streets.

The Commerce Committee of the Lower House of Congress last week discussed the bills recently introduced looking to the regulation of sleeping cars. One of the bills before the committee was that of Mr. Breckner, which requires railroads to own their sleeping cars, or at least to have more immediate control over them than is now customary.

The fire in the lumber yards at Chicago on August 1 destroyed the entire plant of the Siemens & Halske Electrical Co., which had been built about two years and was one of the largest plants of its kind in the world. The fire also did great damage to the plants of the Wells & French Co. and the Barnum & Richardson Mfg. Co., carwheel makers, the loss of the former being about $100,000.

A press despatch from Pittsburgh says that Superintendent Pitcairn, of the Pennsylvania Railroad, will put special policemen on all freight trains to arrest persons stealing rides. Since the Coxey movement began, he says, the mania for stealing rides has grown to such an alarming extent that more people are now riding on freight than on passenger trains. For months past this wholesale train ride stealing has resulted in an average of one accidental death daily on the road.

The consitutional amendment forbidding public officers to accept railroad passes has been favorably reported by the Committee of the Convention at Albany, N. Y.

A mandamus suit against the St. Louis, Alton & Terre Haute to compel the operation of a daily passenger train on its El Dorado division was decided last week in favor of the defendant. The suit was brought by the people of Benton before the railroad and warehouse commission of the state, and this case just decided is one instituted by the commission to compel the company to obey an order made in January. Chairman Cantrell says he will at once appeal to the supreme court.

A train of the St. Louis & San Francisco was stopped by a robber 35 miles from St. Louis on the night of August 2, but the express messenger fired upon him and drove him off. A band of Coxeyites, numbering about 200, boarded a Baltimore & Ohio freight train at Connellsville, Pa., on the night of August 3, and the trainmen, assisted by yardmen, had a prolonged battle with them before they drove them off. About 100 of the tramps were locked up in the cars and subsequently jailed. Two freight trains of the Baltimore & Ohio were boarded by a large gang of tramps near Sykesville, Md., on the morning of August 1. The trains were stopped and the sheriff was sent for, but the tramps got away. Six tramps tried to hold up a freight train on the Reading road near Philadelphia on August 2, but were captured and sent to jail. Thirteen tramps were arrested and jailed at Sing Sing, N. Y., last week for stoning a passenger train of the New York Central.

The citizens of Englewood have adopted resolutions protesting against the proposed elevation of the tracks of the Pennslyvania Company in Chicago, as outlined in the *Railroad Gazette* August 3. They claim that the conditions in this case are entirely different from those which obtain in the case of the Lake Shore & Michigan Southern and the Chicago, Rock Island & Pacific, inasmuch as the Pennsylvania runs diagonally across several blocks between the point where it leaves Stewart avenue and its junction with the tracks of the Rock Island at Sixty-third street. The proposed earth elevation would, they claim, destroy the prospect and the circulation of air, obstruct the travel on numerous important streets and cut the town into divisions in such a way as to greatly disturb property values. A continuous elevated steel structure is demanded with level sidewalks and a depression of the streets of not more than three feet.

Stock Exchange Listings.

The New York Stock Exchange has listed the following securities:

Cleveland, Cincinnati, Chicago & St. Louis, St. Louis division, first collateral trust mortgage 4 per cent. bonds, $2,083,000, making total amount listed $7,250,000. Proceeds of these bonds have been used to retire the remainder of the mortgage obligation of the St. Louis, Alton & Terre Haute Road.

Norfolk & Southern, additional issue of first mortgage 5 per cent. bonds, $40,000, making total amount listed $700,000. These bonds have been issued for terminal improvements at Norfolk, Va.

Pittsburg, Fort Wayne & Chicago, additional issue of guaranteed special stock, $1,916,253, making total amount listed $18,877,403. This stock is issued for improvements and additions to the property.

The Trolley at Hamburg, Germany.

Since March of this year Hamburg has had an electric overhead trolley road. The current is furnished by the municipal electric central station, the equipment of which was increased for this purpose by a 100 kilowatt Thomson-Houston generator, working at a voltage of between 500 and 550. The feed wires, consisting of two heavily insulated copper cables, protected by double lead sheathing and a sheet metal armor on the outside, are buried below the street level at depths of from 18 to about 40 inches. Connection with the trolley wire is made at three different points, at which also there are current indicators and cut-outs. The return is a bare copper wire, laid directly in the earth. The trolley wire itself is not continuous, but is made up of sections about 500 meters, or 1,640 feet long, terminating in insulated points. Connection between these sections is made by cut-outs, so that, ordinarily there is a continuous circuit from end to end. Any one of the 500-meter sections can be at once deadened, if need be, however, as in the case of a fire along the line. In addition to the bare copper underground return wire already mentioned, the rails are connected at their joints, in the customary way, by soft, tinned copper wire. At about every 300 feet there is, moreover, a cross connection of the opposite rails by two copper wires, and at about every 1,600 feet the connecting wires are attached to ground plates buried below the ground water line.

The Smoke Question in Chicago.

It is reported that Chicago's smoke ordinance, which for several months past has practically been suspended, will now be rigidly enforced. On account of the coal strike and the labor troubles, consumers were obliged to take and use anything they could get, but now that affairs are in better condition no leniency is to be shown offenders. It is said that the railroads and tug-boat companies are the principal offenders. Notice has been served upon the various railroads that they will be held to account for all violations reported. As for the tug men, the city claims that oil is cheaper than soft coal, and that unless the boats use that they must burn hard coal. It has been claimed until recently that hard coal could not be used in the boilers as now equipped, but as the tugs have been compelled to use hard coal or nothing at various times during the summer, this excuse will probably now lose some of its force. One difficulty against which the bureau of smoke prevention has had to contend lay in the fact that any one with a political pull of any sort could obtain a suspension of a fine. It is now announced that this will be changed and that fines will in all cases be collected.

The city engineer of Chicago has submitted a report advising the use of West Virginia bituminous coal instead of anthracite in the North Side pumping station. Tests of the coal recommended are said to show a very high evaporation. It has heretofore been considered necessary to use anthracite coal on account of the smoke produced by the burning of the bituminous usually available. It has been found possible, however, to burn this coal successfully without taking unusual precautions to prevent smoke, and it is estimated that a saving of 25 per cent. can be effected by its use.

"Anarchy in High Places."

The remarkable statement of a vice-president of the Pennsylvania Railroad in regard to the free pass evil presents as discouraging a picture of the prevalent moral tone of public life as has recently been drawn. Mr. Brooks refers, apparently, in the last part of his statement, to the State of Pennsylvania. That commonwealth has had in its constitution for many years a clause prohibiting the granting of free passes, or passes at a discount, to any person except officers or employees. And yet this writer tells us that the men in that State who make the laws, the officers who execute the law and the judges who interpret the law, are beggars of passes, and are daily demanding of the roads that they violate the fundamental law to put money into the individual pockets of these men. It would be impossible to conceive of a situation more provocative of lawlessness and anarchy than this. What if it should appear, as may now seem possible, that the judges who issued the Debs injunction orders at Chicago, had their pockets full of railroad passes at the time? and that the United States marshals and other officers of the law were likewise in the pay of the railroads? This would be a situation to breed revolution. The policy of public ownership and operation of the railroads would have to strive hard to produce so scandalous a state of things as is revealed by the recent Atchison developments and this letter of the Pennsylvania railroad official. Before we may hope to grapple successfully with the communistic spirit among the masses of the people, we have got to strike down this communism and anarchy in the higher circles of society. Out of the latter springs much of the former.—*Springfield Republican.*

RAILROAD GAZETTE

EDITORIAL ANNOUNCEMENT.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

We noted last week the circular of President Stuyvesant Fish, of the Illinois Central, in which he handsomely complimented his men on their courage and fidelity during the strike. Similar action on the Chesapeake & Ohio and elsewhere was also mentioned. We now have the pleasure of printing the circular of President E. T. Jeffery, of the Denver & Rio Grande, which reads:

> For the Board of Directors, and in conformity with their expressed wishes, it is my pleasant duty to convey the thanks of the company to the employees in all branches of the service for the loyalty and fidelity generally displayed by them during the recent labor troubles. A very large majority of the employees of this company remained faithful throughout the contention and strife that paralyzed the railway system of the country, and by their attitude and conduct they gave ample evidence of their belief in the mutuality of the interests of the company and the men engaged in its service. To those who were foremost in giving wise counsels and in exerting conservative influences the thanks of the company are especially due.

Railroad men well know the odium that a trainman or other employee incurs when he deliberately takes sides with the railroad company and against an angry crowd of strikers, even if the crowd be not very large. But in that district of Chicago, where car-burners held complete sway over whole square miles, and where placards were posted advising that scabs be assassinated, the conditions were such that refusal of food and lodging, and throwing brick-bats which generally don't hit, come to look like mild and innocent peformances. Hearty praise, therefore, is the very least recognition that the owners of a railroad can give in such a case. We are glad to see that the newspapers generally recognize the true situation. Prominent among those publishing appreciative articles is the *American Architect and Building Record;* and the *New York Evening Post*, speaking of Mr. Fish's circular, says:

> Such expressions on the part of railroad managers tend to promote good feeling and to remove unreasonable prejudices. These managers might, with the approval of the stockholders, go somewhat further, and add to a "vote of thanks" some more substantial recognition of faithful service. We do not believe that men should be paid for patriotism or rewarded for doing their duty. But, as Mr. Fish says, the exertions in this case were extraordinary and the risks undergone exceptional. We do not believe that we misrepresent the stockholders in our railroads when we say that they would heartily approve the expenditure of a portion of their money in paying for services which have had an exceptional pecuniary value to them, and which have cost their employees exceptional sacrifices. It is better to spend money in this way than in rate wars, or even in political contributions.

A correspondent, whose letter appears on the first page, asks why the Interstate Commerce Commission should not have more respect paid to its decisions. Aside from the technical point, which all our best lawyers would press with great persistence, that the spirit of the constitution would be violated if controversies involving many thousands of dollars were allowed to be settled by any other body than a court, the question is answered, we think, by the experience of the last seven years. The commission has secured obedience to such of its orders as were reasonable, and, in fact, to some which probably leaned too far toward the side of the public. Take the most common question that has come up, the long and short haul clause of the law. It nearly always presents itself in a knotty form, and the public has generally been given the benefit of the doubt; and the railroads have acquiesced, often with a loss to themselves, and without appreciable benefit to the public. (It is to be remembered that where the long and short haul rule is violated or suspended, there is generally a benefit to some portion of the public, and the only danger is that railroad officers may favor some one locality unduly.) The questions that come before the commission are of that intricate kind on which the wisest men disagree, and many of them can be settled only tentatively at best. Where a principle is involved, it is generally one whose settlement hinges on such subtle ethical or economic distinctions that in ordinary litigation no one is satisfied until the question is carried to the Supreme Court; and even there the dissenting minority is often large. In such hair-splitting it is well that we are bound to the long settled principle that the order of things as existing at the outset shall continue unchanged until the proposed change shall be finally adjudicated.

Our correspondent's view, like that of many other people, seems to be based on the idea that so far as transportation questions are concerned, the Interstate Commission might rightfully be granted the powers of the Supreme Court, or, at least, that every one ought to strive to accept its decisions in that spirit. There is something to be said in favor of this notion, for transportation now involves so many technicalities that the decisions of very good jurists are often warped by erroneous views or by habits of mind which a full knowledge of railroad practice would have corrected. This is one of the inevitable limitations of the human mind of which there is no use complaining. But it will be time enough to give added weight to the Interstate Commerce Commission's views when that body shall be so constituted as to give constant assurance that its views are worthy of such confidence. The Supreme Court is respected because every one feels sure that vacancies upon it will always be filled by a selection from the the best minds the of country. It is true that in case a weak man became president, the fact that this assurance depends upon sentiment might become painfully apparent; but the Supreme Court is the firmest support of our Temple of Justice, nevertheless. But the majority of the Interstate Commerce Commission may one year be composed of political hacks or second rate lawyers, and within two years thereafter be made up of strong partisans of the railroads. The influence of party politics is always present to vitiate the best intentions of the appointing power, if it aims to get men familiar with railroad affairs, and there is not the life tenure to counteract the smallness of the salary and to give independence of judgment. With these hindrances their securing of the ideal commission, and others which will suggest themselves, it will readily be granted that our commission had better have more wisdom before it has more power.

The New Orleans *Picayune* of recent date has the following:

> The superintendents of all the roads in this city having lines running through Mississippi were lately summoned to Jackson before the railroad commission to answer the question why there should not be laws enacted requiring railroad officials to give truthful statements about railroad accidents. The meeting was of short duration. Every superintendent present said at once to the commission: "There is positively no objection to the passage of a law requiring railroads to give information to papers of accidents, or, indeed, of anything else we can. Pass such a law. We have no objection." It is not learned what action will be taken by the commission, but there seems no doubt that such a law will be enacted.

Why, of course there is no objection. Every reasonable superintendent complies with the proposed requirement already, and if there is one who intends not to comply with the law he will have little trouble evading it. Moreover, there is not one superintendent in a thousand who will not give a fuller and better account than any law could compel him to give, provided only that the news gatherers come to him. The trouble comes from the thoughtlessness of employees who are not "officials," who will sometimes innocently mix up their own opinions with guesswork misinformation in a way that would gladden the heart of the most sensational fake-monger. Many right-minded superintendents deem it necessary to order such employees to refer all inquirers to the superintendent. But a law can do no possible good except to give expression to the wishes of the people, for the originator of a deceptive report can very rarely be detected by the ordinary processes of the courts, much less punished. The railroad commissioners of Mississippi or any other state should right this matter themselves, not ask the legislature to do it. Withholding or delaying proper information is an injury to the public which will produce its own cure if it is only made public in an effective manner. Every instance complained of should be thoroughly investigated by an impartial commissioner, or other person whose verdict will carry weight, and the circumstances published, including the names of the culpable persons, so far as they can be ascertained. That will do more good than a bookful of laws.

Indicator Measurement of the Limit of Negative Lap.

The practical results of using negative instead of positive lap and the theoretical effects on the economy of locomotives have been discussed at considerable length in the *Railroad Gazette*. See the issues of September 9, 1892, page 670, and March 9, 1894, page 174. See also Mr. C. H. Quereau's paper on "Steam Distribution," before the Western Railway Club, in February, 1894. There is no ground for asserting, as some do, that negative lap lessens the efficiency of locomotives, and there is much evidence to show that it increases the efficiency when the proper amount is used.

Primarily, in starting out to design a steam cylinder and its valve gear one always considers the amount of steam to be passed through the direct steam passages and the exhaust, and the size of the passages and the dimensions of the valve motion are then made such that the steam distribution will be in accordance with the accepted and well established theories of steam engines. The fundamental conditions which are sought after and which the theory points out to be necessary in order to get the efficiency of operation that may reasonably be asked for, are as follows: Nearly full pressure during the period of admission of the steam to the cylinders, a point of cut-off that will permit the proper amount of expansion of the steam before it is exhausted, an exhaust opening that will permit the steam to escape of itself and not be pushed out by the piston (or, in other words, an opening that will give little back pressure), an exhaust closure at a point in the return stroke of the piston that will confine enough steam in the cylinder ahead of the piston to take up some of the inertia, or stored energy, of the piston and its connections and raise the pressure in the clearance spaces considerably above the pressure during the exhaust period, and a sufficient opening of the steam valve, called "lead," prior to the piston reaching the end of the stroke, to raise the pressure in the clearance spaces to the boiler pressure by the time the piston reaches the end of the stroke, and to assist the compressed steam to absorb the stored energy, or inertia, of the piston and connections. Of course there are other primary considerations in steam engine design, but they do not relate to the steam distribution, but more especially to the saving of condensation and reduction of heat losses.

To those not experienced in steam engine work it might seem almost impossible to determine when the conditions here set forth are fulfilled, as no human eye can observe the action of steam within a cylinder. Even with a glass cylinder we are still baffled, as steam under pressure is practically invisible. Up to this time there is only one way of gathering data of real value about steam distribution, and that is by the indicator. This simple instrument, which records the pressure during all parts of the stroke automatically upon a small piece of paper, has, because of its great value and usefulness, been brought to a high state of perfection, and stands to-day as one of the most accurate measuring instruments used in steam engineering work. It is so complete in its measurement of steam action in cylinders that there is no other instrument to check it by. But from a very large number of tests under limited conditions it is known that this useful instrument is, for all practical purposes, absolutely correct in its indications. Yet there are those who are so biased, in the face of the fact that they have no proof of a single delinquency of the instrument in practical operation, when properly manipulated, as to denounce the device as misleading and inaccurate and claim that it is necessary to fall back upon the results of the combined efficiency of the boiler, cylinders, valve motion and other apparatus of a locomotive, as shown by actual service during long periods of time, to show the comparative merits of two different systems of steam distribution in the cylinders. Such a plan as this is worthless for several reasons, but particularly because it takes no account of the wide differences in the "personal equation" of the engineer and fireman and the methods of operation, which differences, in their effect on the efficiency, are sometimes greater than would be found between a good and a bad steam distribution.

The preceding statement has been made with a view to setting forth three important facts that must not be forgotten in comparing the steam distribution in different locomotives, as without them there is no basis that is either competent, just or scientific. These facts are (1) that the steam engine indicator is the only instrument extant for the determination of the distribution of steam in cylinders; (2) the instrument, when of a proper kind and when manipulated with ordinary care, is accurate and reliable to a degree far beyond all practical requirements, and (3) the theory

of steam engines has been developed to a point where it is known, with a degree of accuracy far beyond the requirements of locomotive practice, what is the most economical steam distribution for a given set of conditions. Therefore, when the heat losses by conduction and radiation are reduced by proper design and sufficient lagging, and a good indicator properly handled shows the steam distribution in the cylinders to be in accordance with the established theories for any given set of conditions, engines thus tested, so far as the cylinder apparatus and valve gear are concerned, may be considered as working very close to the maximum efficiency obtainable in practical service.

The conclusion of the preceding paragraph is as safe and reliable as most things connected with finite affairs, and it kept in mind will prevent losses of time, money and patience in experimenting with "fake" devices put forth to increase the efficiency of locomotives by those who disclaim scientific training and actual experience in accurate investigation, but who do claim, by a "lucky hit" or "stroke of genius" to have discovered some revolutionary mechanism that will accomplish fabulous savings. Many such decry all accurate methods of testing, the indicator included, and rely on sharp practice to show gains. Such promotors are not "straw men," but realities. The inventors of two different styles of improved valve gear of recent date, when asked for indicator cards to show the action of their devices, replied that they hadn't any, but that the mechanism worked all right and they didn't believe much in indicators. "Inventors" of this kind will show (if we accept their assertions) such great percentages of saving that if we add them up we shall find that we can run locomotives up and down the road without hauling any train at all and make money at it.

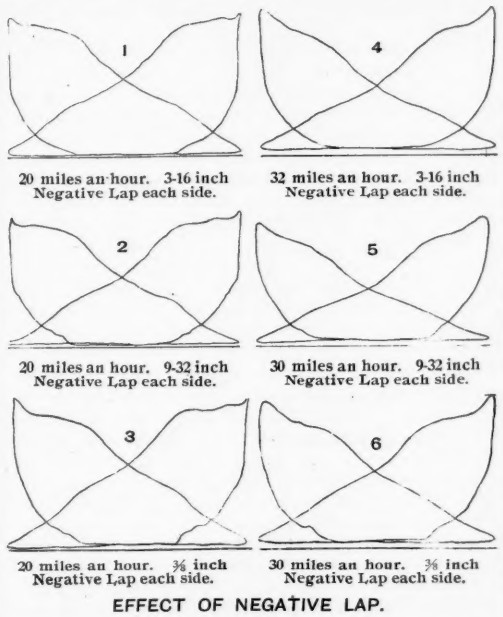
The limits of possible saving with proposed changes in valve gears, as with other devices, can be defined with great accuracy by theoretical analysis, and beyond this limit no device can go. It cannot even reach the limit any more than perfection is reached in other things in life. The limit of possible saving from the use of devices put forward as improvements in grates, fire boxes, feed water purifiers, feed water heaters, injectors, smoke stacks, exhaust pipes, steam valves, valve gears, piston rod packing, etc., can be determined, theoretically, with sufficient accuracy to say that the improvements cannot save more than a given amount, and that they will for many reasons give less saving, as they are bound to fall short of perfection. The saving of fuel in locomotives is a mighty hard problem.

Coming now to the subject of negative lap, the reader will understand our argument that if the instrument for the measurement of steam distribution, the indicator, shows that the removal of a few pounds of cast-iron from the interior of the slide valve of a locomotive gives the same improvement in the compression and back pressure lines of the indicator card as a new and intricate valve gear, viz., a reduction in both lines, then such removal of useless material reproduces the same betterment as can be obtained by using the new device. Valve gears of this sort are brought forward from time to time, but they invariably drop back into obscurity, for the good reason that equally good results can be obtained with simpler apparatus and less sweeping alteration. Complicated valve gears are wholly antagonistic to the beautiful simplicity of the locomotive as it is to-day and as it has been since the American locomotive became a type by itself. Men who have wasted their time, money and energies on new gears have only themselves to blame, as they might, by preliminary scientific examination, have found the fallacy for themselves.*

To show how negative lap will affect steam distribution, and as an indication of the limit to the amount of negative lap that can be used under some conditions, we show the accompanying diagrams, received from Mr. Robert Quayle, master mechanic of the Ashland division of the Chicago & Northwestern. These cards were taken from a 17 in. by 24 in. eight-wheel locomotive to show the effect of negative lap. The diameter of the drivers was 64¾ in. The steam ports were 16 in. by 1¼ in., and the exhaust ports 16 in. by 3 in. Throw of eccentrics in each gear 5 in., and in forward gear 5½ in. Mr. Quayle says:

"Of the indicator cards Nos. 1 to 6, one was taken at 32 miles an hour, two at 30 miles, and three at 20 miles. The total inside clearance was ⅜, 9-16 and ¾ in. as marked on the cards; that is, 3-16, 9-32 and ⅛ on each side. You will see that in the three cards with the ⅜ in. inside clearance, the one at 32 miles an hour shows a better line than the one at 20 miles an hour. This, as you are aware, is due to the fact that in the slower speeds more steam blows over to the opposite end of the cylinder. You will find the same condition exists in the cards with the 9-61 in. clearance, only in a greater degree. The cards with the ¾ in. clearance show conclusively that it was altogether too much, and the conclusion arrived at is that with this class of engine ⅜ in. was all we could use to good advantage. I have traced card No. 4 and placed it over No. 6, and we found the compression in card No. 6 with the ¾ in. clearance is greater than it is in No. 4 with the ⅜ in. clearance; so that there is no gain with the ¾ in. clearance as compared with the ⅜ in. clearance, and it does not make such a scientific card."

The extent to which the introduction of the improvements of steam distribution in locomotive cylinders, by cutting out the inside of the valve to give negative lap, has already gone in this country, is


1
20 miles an hour. 3-16 inch Negative Lap each side.
4
32 miles an hour. 3-16 inch Negative Lap each side.
2
20 miles an hour. 9-32 inch Negative Lap each side.
5
30 miles an hour. 9-32 inch Negative Lap each side.
3
20 miles an hour. ⅜ inch Negative Lap each side.
6
30 miles an hour. ⅜ inch Negative Lap each side.

EFFECT OF NEGATIVE LAP.

possibly not appreciated by most railroad men. More than twenty large roads have made trials and we have yet to hear of the first case of failure to get a "smarter" and a more economical engine where the amount of clearance was carefully selected for the conditions of sevice. The largest amount of clearance so far used is that on the Pennsylvania compound No. 1,515, which has ⅝ in. on each side for the high-pressure side and ¾ in. on each side for the low pressure. With this amount of clearance the beautiful indicator cards exhibited by Mr. Axel S. Vogt to the Western Railway Club, at the March meeting, this year, were taken. It was only by using this large amount of clearance that such steam distribution was possible. Compound engines require more negative lap than single expansion engines, and the amount used varies from ¼ in. to ½ in. on each side. For slow moving engines, switchers and mountain climbers, negative lap is neither necessary nor desirable, but for passenger and fast freight locomotives from ⅛ in. to ⅜ in. on each side is used according to the size of the driving wheels and the length of the valve travel. With large drivers the number of revolutions per minute is less, and less negative lap is necessary. With long valve travel the amount must be greater than with short travel, as the valve moves farther in a given time with a given number of revolutions per minute, and the port openings are all greater; and to make the exhaust remain open for an equal portion of the stroke more initial opening, in the form of negative lap, must be provided.

* An example of mechanism of this kind and some remarks about its folly can be found in our issue of August 3, page 533.

Efficiency of the Railway Mail Service.

The discipline of the railroad mail service has come in for incidental discussion in connection with the strike. A New York paper, in arguing against government ownership of the railroads, tells how the personnel of the railroad service would probably be injuriously affected by such a change, and says that the evil influence of unprincipled agitators among the men would not be got rid of; and as an evidence of this it is stated that such agitators have made trouble in the mail service now and then. We have nothing to say against this argument; the agitator must be looked out for everywhere, and the strike of letter carriers in London a year or two ago is a reminder that the mere fact that the employer is the government does not do away with the deep-seated causes that have produced wages disputes in all ages; but disturbance of this kind in our railroad mail service is something that we never heard of, and it must have been of a very ephemeral nature, if it ever existed.

But the efficiency of the mail service is superior to that of those departments of the railroad service which can be fairly compared with it, and it will not be out of place to call attention to it at this time; though railroad workmen have no ground for jumping to the conclusion that it would be a good thing for them if the government were to buy the railroads. Neither should superintendents hastily assume that if they had the government at their backs they could work magic changes without trouble. A superficial examination might lead to the conclusion that if the government took the railroads it would soon elevate the personnel of that service to the standard now prevailing in the mail cars. That standard is high enough to teach railroad men some important lessons, and these would retain their merit even if the service should be weakened by unwise trade unionism. But there are good reasons for the difference in efficiency between the mail and the railroad service. The two main ones are good pay and a constant, systematic endeavor to elevate the quality of the work done. This last is one of the elements which we usually include in the general term discipline, but in making comparison between the mail and the railroad service it is desirable to look at it more specifically.

While the men in the mail service probably do not earn much more than those of like intelligence and moral character in the railroad service, say conductors, station agents or clerks, still it is fair to say that their pay is more satisfactory, for (1) men in the government service are more free from the feeling that the tendency of salaries is downward, and (2) their pay is better as compared with the variety and degree of qualification required for the work. We have no doubt that railroads could get better service, and could gradually elevate the moral and intellectual level of their employees by paying them more money. But this is not the way to approach the question, and we do not purpose to approach it in this way. We merely mention the fact that good pay is one of the elements essential to the efficiency of the mail service. Many railroads could not adopt this means of improvement if they desired to. The government gets its money from seventy millions of people, two cents at a time, so that they do not feel the expense much. Railroads have to get their money in a way that is much less easy. Even if the railroads were owned and run by the government it would by no means follow that every railroad man could have a good monthly salary, twelve months in the year, with two weeks' vacation every month. Paying a million men would be quite a different matter from paying the seven thousand mail clerks. The former would have to be done out of the income from freight and passenger business, which business must be carried at reasonable rates *in order to get it to carry*. A deficit, even a very small one per unit of traffic, would be too big a burden to relieve by taxation. Not even the government can run railroads without due regard to making both ends meet.* The mail service, on the other hand, can keep salaries up in spite of hard times, because even a large deficit can be made up by a tax that is hardly felt.

But good pay only *supports* an efficient service. It is the bed plate of the machine, but does not operate it or repair it when it is out of order. The better the pay the better the grade of men applying for positions, but even with men of the best natural or self-acquired abilities there may be a very inefficient service. All old railroad men will recall illustrative instances of this on roads which trusted for success to their good earnings instead of scientific methods. In fact, the most generally noticeable defect in railroad service is the widespread tendency to trust men to use their own judgment instead of training the whole force to conform to the superintendent's judgment. We do not mean to say that this is an alarming defect or one which causes serious immediate loss; but it is a cause to which can be traced numerous collisions of trains, much inefficiency in the passenger service, and other things which, in the long run, affect the prosperity of the company.

* The Prussians are eager for a reform in passenger fares, the countries all around them, even Russia, having made great reductions; but the Minister of Public Works, strongly supported by the Minister of Finance, says that the country at this time can't possibly take the risk of a decrease in net earnings, which would probably follow such change as it is desired to make.—*Railroad Gazette*, June 29.

The salient point of railroad history in France is that in 1893, with 21,000 miles of road, the earnings were only $105,000,000, as compared with $110,000,000 on 15,000 miles in 1881. The sweeping reductions in rates two years ago increased the gross receipts but not the net. The Government guarantees the dividends on the stock of the railroads, and this cost it $23,000,000 this year. M. Camille Telletan says that the indirect burdens upon the tax payer are greater than the direct, so that for next year the railroad deficit will really be about $82,000,000.—*Railroad Gazette*, June 29.

Examples of the difficulties encountered where the State operates the railroads may be occasionally found in the foreign railroad notes published in the *Railroad Gazette*. In Germany the railroads have not only their own legitimate burdens, but it is now said that the Ministry uses the railroad system for the purpose of making a profit to hand over to the Government at the end of the year, to be used to relieve grievous burdens in other departments—as, for instance, to support the vast military establishment.

Not good pay, therefore, but the constant striving for improvement is the most active element in the efficiency of the mail service. While the mere sorting of letters is, in a sense, only boys' play, the government officers look as carefully after details as though each letter were a ten dollar bill. By employing men to do boys' work they get the benefit of all the stability of character, perseverance and other well known qualifications which make a man's work better than a boy's. The employment of the simple principle of *teaching*, teaching besides that which every man may get out of his every day work, accounts in large part for the excellence of the railway mail service. The halting, half-hearted way in which the railroads—speaking generally—have made use of training classes, or catechetical instruction of any kind is in marked contrast to the systematic arrangements by which the mail clerks are made to spend days or weeks in studying geography and train connections. By this study they fit themselves to handle letters for far distant places with the accuracy and precision which a way bill clerk or a freight loader exercises when dealing with places on his own division.

Records are kept in the mail service by which each man's efficiency is compared with that of his fellow, and extracts from these records, published in the newspapers, show that the percentage of imperfect work is being gradually reduced year by year. In the railroad service there is hardly an attempt at systematic records, not to mention printing their results as an incentive to emulation by others. The best that has been done, so far as we know, is to keep a negative record, a record of men's blunders, so as to know who are the least efficient. Why not keep more records of merits, so as to make comparisons at the other end of the account? Even where this could not be done with sufficient precision to make the results useful in promoting (or discharging) men, a little activity in this line might be a valuable means of enhancing employees' interest in their work. For instance, why not circulate records showing which station agents handle the most freight or make the most way bill entries at the least expense?

We will not further multiply words, for our only purpose is to remind railroad officers of what they, some of them, seem to have forgotten—that efficient service is easiest secured by employing men whose qualifications are well up to the grade of work that they have to perform, and then training them *all the time*. The postal clerks are generally men who could well do a higher grade of work than that assigned to them, while in the railroad service one of the commonest things one observes is that many individual employees are not up to the level of their work. And whichever remedy we apply here, whether the improvement of the men in the service or the substitution of new ones in their places, the rational application of it includes, as an essential element, the establishment of records and inspection which, whatever the kind of man, will get out of him the best that he is capable of."

Value of Union Pacific Branches.

In the present entangled condition of Union Pacific affairs the most noticeable thing now is the appeal to the courts on behalf of the Receivers for a decision whether the branch lines of that systems which do not earn fixed charges shall be operated under the orders of the court, and whether the bond interest shall be paid when perhaps it may not be earned by the working of the branch roads separately considered. Of course, the cases of these branch roads must each be considered on its own merits, and these merits differ widely. Yet taking a broad view of the situation it is not generally known how dependent upon the branch system the main line of the Union Pacific really is for the earnings which it publicly reports.

It is understood that the present Receivers have prepared statements for presentation to the court which show exactly what each branch road is earning; but for a general view the best figures are found in the report of the United States Pacific Railway Commission made to Congress in 1887. A table of earnings for that year as given by the Commission is worth printing:

Net income of branch lines, exclusive of interest on bonds	$1,446,123
60 per cent. of traffic on main line to and from branches	3,277,070
Direct and indirect income	$4,723,194
Interest on branch line bonds in the hands of the public	1,080,465
Surplus income to the Union Pacific main line	$3,642,727

This table is based upon the supposition, which was testified to as a fact by all the railroad men, that traffic to and from the branch lines could be hauled several hundred miles over the Union Pacific main line at a cost of but 40 per cent. for operating expenses, the proportion of operating expenses for business, originating on the main line being over 60 per cent.

A little calculation will show that in that year the gross income of the Union Pacific main line from traffic interchanged with the branches was $5,500,000. The gross earnings for that year were $19,500,000 and the net earnings $9,000,000. Thus the gross earnings of the main line from branch line business were more than one-quarter of the total earnings, while the net earnings from the same traffic, according to the table just quoted, were more than one-third of the total net receipts; and with the net earnings on the branches themselves made up a sum equal to more than one-half of the nine millions net. Thus without the traffic which the branch lines give to the main line of the Union Pacific, that company could not earn much more than interest on the first mortgage bonds. Without the branch line system, therefore, the second mortgage bonds belonging to the government would have little or no security.

This fact alone is enough to warrant the Federal authorities in treating the holders of the branch line bonds with a good deal of consideration. Indeed, by combining together and building a new main line connecting these different branch roads with the Missouri river at Omaha, the branch line owners could make good their rights against an absolute foreclosure of the government's second mortgage. Such a new main line, of course, is not likely to be built, but the moral argument is one to be considered.

Not long ago an English journal, the *English Mechanic*, quoted a paragraph or so from one of our recent articles on the metropolitan railroad systems of New York and London. After quoting what we said of the possibility of fast speed and frequent trains, without block signals and with great safety, on the New York elevated railroads, the writer in the English journal says: "This paragraph wants completing by the statistics of injuries to passengers from causes beyond their own control." In order to complete the paragraph we will give a few statistics; we believe that they are unprecedented in the records of operation of steam railroads, and we are satisfied that they are quite authentic. For the ten years ending June 30, 1894, the elevated railroads of New York City carried 1,744,230,127 passengers, an average of 477,609 a day. This vast traffic was carried without killing a single passenger on a train from causes beyond his own control; and, so far as we can discover from an examination of the records, there was no injury, either fatal or otherwise, to passengers disembarking from the cars. The only fatal injury to a passenger riding on the cars seems to be one entered as "head projecting out of car window." Three passengers were killed and two injured while attempting to board moving trains. Only eleven injuries, and these mostly slight, are charged to collisions, an average of 1.1 a year. This solitary item is the only one of real interest in connection with the query presented by our contemporary, for the others have no connection with collisions or train accidents of any kind as affected by the use or non-use of the block system. The most serious accident on the elevated roads during the period named was the pushing of a number of passengers off the elevated structure to the ground on the occasion of a great fire which occurred several years ago. Many trains were compelled to stop and wait some time between stations, and the passengers, contrary to the rules, got out and walked along the narrow employees' platform at the side of the track. While this platform was crowded a passenger attempted to board a slowly moving train, and in doing so was unable to either get into the car or get back to his position on the platform, and his projected body knocked a number of persons into the street. Four of these were killed and seven injured. The list of casualties contains an item of one passenger injured by being pushed from the station platform by a crowd. Having reference to the duty of police protection the company might be deemed guilty of contributory negligence in a case like this; and, taking an extreme view, the preceding item might perhaps be thought by some to belong in the same catagory. But after thus giving full weight to the most unfavorable items, we still have an extraordinary record for safety. The total number of fatal injuries of all kinds for the ten years was 41, and of non-fatal, 38. The deaths include nine suicides, and the totals include intoxicated passengers and all the usual cases which are practically unpreventable. This paragraph was begun for the purpose of showing the excellent arrangements of the Manhattan company for the safety of trains; but the presentation of these figures affords occasion for saying, what indeed could not be fairly omitted, that the station arrangements—passageways, stairs, doors, platforms, railings, car platforms and gates—and the discipline, are equally worthy of praise. We know of no better railroad discipline anywhere. General Manager Hain cannot get $2 men for $1.50 any easier than many other managers can, but he seems to always get out of each individual the best service that that man is capable of.

The British Board of Trade Accident Return for the first three months of this year shows that the number of passengers killed was *nil*, and of employees, one. Twelve accidents were investigated by the inspecting officers of the board. One of these was at Talerddig Top, on the Cambrian Railway, February 23, where a passenger train broke in two at the top of a grade, just after a pushing engine had been cut off, and was stopped so quickly by the automatic vacuum brake that the pusher ran into the hind car, doing slight damage. The accident itself was not perhaps notable, but we refer to it for two reasons: First, as a crumb of comfort to Americans who are exasperated at the way the English make such splendid records of safety. Here is an incident of slip-shod management which, we have no doubt, will be much relished by some of our readers, for it *is* discouraging to have those Britishers continue their march toward perfection without interruption year after year. But the inspector, Major Yorke, severely condemns the detaching of an engine until the train comes to a stop, and also reminds the company that the use of a pusher without having the automatic brake connected through to it from the front engine is contrary to the law of 1889; and he says that the rule now adopted by the company, forbidding the uncoupling of engines until the train is stopped, ought to be made applicable to freight trains as well; and finally that helping engines should, as a rule, be attached to the front of a train and not to the rear. And, indeed, this indicates our second reason for printing the item, for such an accident as this will happen some day and kill somebody. Theoretically, the pushing engine may be so well braked and the man in charge of it so alert that in case the train should be stopped by an emergency application, he (the runner) could make a similar application and avoid doing much damage; but practically we all know that the chances are about 100 to 1 against his seeing the emergency in time to act with sufficient promptness. The English train broke in two in consequence of the fracture of a drawspring buckle. The cause of the fracture could not be definitely ascertained. The car had been in use since 1863 and had been in the shops thirty-one times in thirty years, but there is no record of the drawbar or its connection having been removed. The inspector thinks, therefore, that the eye of the buckle was worn out by age. Major Yorke incidently criticises the company for allowing a brakeman to get off a passenger train when it was running at its regular speed. It appears that this brakeman, Wilson, was on this train going to take charge of a freight. It was a single track road and he found the freight at a side track sooner than he expected, and so jumped off.

There are three cases in our railroad law column this week, the 15th, the 18th and the 20th, which were probably decided justly, protecting the railroad companies from exorbitant demands, but which are of interest to operating officers chiefly as reminders that if they wish to give the public the best service and to keep their own reputations high, they must set their standards a good deal higher than the courts set them. The very highest standard of judicial strictness only requires what may be called an ordinary degree of efficiency and vigilance; while the superintendent who aims to make a perfect record, knows that he must always strive for the best service and appliances. The boy who loosened the brake in Pennsylvania probably could not have been detected in season by any practicable watching, but a collision from such a cause is deplorable nevertheless, and the case suggests the importance of connecting side tracks to the main tracks, wherever possible, in such a way that cars will have to be run up grade to reach the main track. In the case of the falling rock it would probably be no great hardship for the railroad manager to have to prove his own due diligence, for he certainly would aim to take all possible precaution, for his own peace of mind; the suit of the passenger was probably contested on technicalities because it embodied too big a claim. The Michigan case is clearly one where the superintendent ought to hold his men to a higher standard than the court does. There is no fun having passengers step off into the ditch in the dark even if it is their own fault. On some roads the brakemen say "Next station is Woodchuck Creek; crossing stop." This does not seem to be the most graceful way of putting it, but we do not know of anything better. If there are a sufficient number of brakemen the best way of course is to give no announcement at all, for any given station, until the train has passed all places where it is liable to be stopped. Even this plan has its drawbacks, however; the only satisfactory way to get along with blundering passengers is to have enough trainmen to keep watch and warn them when they try to break their legs.

If the press despatches give a true view of the situation the people of Brazil, Ind., are likely to have a peculiarly effective illustration of the lesson, recently taught in Chicago and elsewhere, that the citizens of a town are responsible as a body for the maintenance of public order within their borders. Brazil is in the center of a coal mining district and has been the scene of a good deal of disturbance in connection with both strikes, that of the miners and that of the railroad men. There, as everywhere, lovers of violence naturally sympathize with each other, and mobs seem to have been easily gathered without regard to the origin of the alleged grievance on which they were based. At Brazil, as at some other places, violence has been kept up all along by individuals and small bands regardless of the failure of the strikes, and on Sunday last two employees of the Chicago & Eastern Illinois road were beaten by a mob in the streets and one of them will die. Another man who went to Brazil to take a position on the road was attacked in the night, but made out to escape. Now, as a consequence of these and similar outrages, the railroad company has announced its decision to tear down its repair shops at Brazil and move the works to Momence, Ill. This aroused the better class of citizens to a realizing sense of the situation and active efforts were begun to straighten things out. A public meeting was held and 300 leading citizens offered their services to assist the officers of the law in keeping order. Over $2,000 was subscribed to bring offenders to justice. An appeal was made to the managers of the railroad, but the work of

tearing down the buildings had already been begun, and at the present writing there seems to be no prospect of preventing the removal. The General Manager of the road told the committee which applied to him that the city and county authorities had refused the company protection; the sheriff had appeared on the company's property, when appealed to for protection, wearing the strikers' white ribbon; and when deputies were asked for he swore in strikers who placed upon the engines oil cans filled with emery. He said that when the non-union men appeared on the streets they were assaulted and driven out of the city and the boarding houses refused to feed employees. Now the citizens are talking of suing the road for $20,000 which was contributed by the town to get the shops located there. It is to be hoped that they will, and thus give the matter an airing in court. It appears to be an outrageous state of affairs, but it is not different in kind from what has been experienced in Aurora, Ill., Packerton, Pa., and many other railroad towns.

The turbulent district of Chicago seems to have finally become quiet, and it was announced on Monday last that the Governor had ordered the dismissal of all the militia now on duty there. The officers of the American Railway Union held meetings in Chicago several days and declared the strike off, "except on the Chicago & Eastern Illinois and the Atchison, Topeka & Santa Fe." What this exception amounts to it is hard to see. Many hundreds of the late strikers applied for work on Monday at Chicago, but to no avail. A crowd of 500 attempted to make a disturbance at the stock yards but the police dispersed them. At last accounts about 900 men were at work in the Pullman shops. On Wednesday of last week Mayor Hopkins of Chicago refused to grant a permit for a parade of Trade Unions in honor of Debs. At Argentine, Kan., last week a large meeting of Atchison employees sent a communication to the United States Court refusing to appear before the court on a supposed charge of contempt, and the reporters made considerable news out of it; but the judge of the court says that the men are kicking at the air, as probably they have done nothing to make the order apply to them. There was a large strike in the packing houses at Omaha on August 2. At Denver last week seven ex-railroad employees were fined $10 for retarding the mails by refusing to handle trains in which there were Pullman cars. At St. Paul an engineer and fireman of the Eastern Minnesota who were tried for abandoning a passenger train on the line, were released, the Government failing to make out a case of conspiracy.

Claims amounting in all to about $275,000 have been filed with the city and county officials at Chicago by various railroads and shippers whose property was burned or otherwise destroyed or lost. Some of the roads have announced that they will not pay the losses of shippers but will assist them in recovering damages from the city. Sixty-two of these claims have been made by shippers for amounts averaging about $450 each. Swift & Company present a claim for $65,000, the highest claim made except that of the Pennsylvania Company, which is for the sum of $144,577.

One of the half dozen schemes for a 100-miles-an-hour electric railroad has come to grief very early in its history. The bill introduced in the House of Representatives by Representative Catchings, of Mississippi, some weeks ago to give a charter to the National Rapid Transit Co. is to be reported adversely by the House Committee on Judiciary. The bill as it came before the committee contained in a preamble a disquisition on the progress of electric power, and recited that the time had come when steam locomotion, having reached its limit of speed, must be supplanted by electricity. The terrible danger of running freight and passenger trains on the same tracks was pointed out and, there were sundry other paragraphs of the same kind of stuff. The bill proceeded to incorporate the National Rapid Transit Co. to build a continuous railroad from New York to Washington City. The structure was to be of iron or steel, elevated 2 ft. above the ground except through cities where it was to be high enough to permit vehicles to pass under it. All this was to enable trains to run between the two cities at a speed of 120 miles an hour. The names of a number of prominent business men of Philadelphia, among them Hamilton Disston, were given as the incorporators, but the prosaic minds of the members of the committee apparently failed to enthuse and the bill is waste paper.

NEW PUBLICATIONS.

Manual of Irrigation Engineering. By Herbert M. Wilson, C. E. New York: John Wiley & Sons, 1893. 8vo, pp. 350. Illustrations.

This is a valuable and timely book, and it has a full and clear table of contents and a copious index. A somewhat novel feature is the insertion at the end of nearly every discussion of principles and descriptions of executed works, of a list of the publications from which the data given and the rules recommended are derived, and in which a fuller elucidation of the grounds on which the author's conclusions are based, may be found. This is a good idea and is fairer to the student of the subject than either a simple statement of the author's view of facts, or an elaborate exposition of principles in a book intended as a manual for ready reference. It does not appear from anything in the book or in the author's contributions on irrigation to the *Transactions* of the American Society of Civil Engineers that he has taken any active part in either the design, the construction or the management of irrigation works, except so far as his position as one of the engineers to the United States Geological Survey brought him in contact with the problems involved in the utilization of the vast tracts of arid lands in the western part of the United States. In the preface it is stated that the interesting data regarding irrigation in India were largely derived from personal inspection, but there is nothing to indicate when that inspection was made, an omission which is to be regretted. In some respects, one of the great merits of the book, in these days of self-laudatory compilers of data, its extreme impersonality, is to be regretted, for it would be interesting to know whether certain novelties of nomenclature, such as "'acre-feet" and "second feet" and "diversion weirs" are original inventions or have been sanctioned by custom anywhere. As defined by the author they are good inventions at any rate.

Beginning with a concise yet clear statement of the extent, value and cost of irrigation of arid lands in the West, the author proceeds systematically to discuss the hydrographic problems involved, to which 62 pages are devoted. Canals and canal works occupy 150 pages, and this branch of the subject includes the distribution of the water over the land. The discussion of storage reservoirs occupies 100 pages and includes an essay on masonry dams in which the author evidently gets beyond his experience and indulges in some crudities and contradictions. But this is a small matter compared with the value of the book as a whole, as a manual of information on a subject so important as the irrigation of our arid Western lands has become, and of which so little is known by our civil engineers and by eastern capitalists, who will doubtless be called on at an early day to furnish funds for the development of projects in this direction to an extent which will probably surprise many of them.

Alternating Currents, Wiring and Distribution. By William Le Roy Emmet, M. Am. Inst., E. E. New York: The *Electrical Engineer*, 1894. 76 pages. Price, $1.

The field which Mr. Emmet attempts to cover in this little book is very large and very important. Consequently, to make the book really valuable he must limit it pretty strictly to the statement of principles and fundamental ideas, leaving the development in practice to larger works and special articles. This has been the plan which he seems to have carried out with a good deal of success. He describes in his first chapter the influences affecting alternating distribution, such as surface or skin effect, the influence of neighboring alternating circuits and of self induction and other conditions affecting distribution. He then takes up the effect of transformers and motors in circuit, and follows with the methods of determining step-up and step-down transformers for long distance transmission, including a discussion of the two-phase and three-phase transformer system. He discusses alternating current wiring and its relation to town lighting, under which head he treats somewhat of running conductors in ducts and iron conduits. The author has kept in mind throughout his purpose of making the book so simple in treatment that it will be useful to a practical electrical engineer and station manager.

Political Reform by the Representation of Minorities. By Matthias N. Forney. New York: Published by the author at 47 Cedar street, 1894. 200 pages, octavo.

That the method of nominating and electing the representatives of the people in almost every democratic government of the world, whether in a municipality or in a nation is crude the results prove. Whether or not in the ideal democracy which is gradually evolved, and which finally endures through future ages, everybody will vote, or vote as is generally done now; and whether the machinery for nominations will be essentially what we are familiar with now, is a fertile ground for speculation; but that we get anything like ideal results now no candid and intelligent man can claim. A favorite theory among some of the most enlightened political reformers has been for years that of cumulative voting, by which minorities can make sure of being represented, and which has been followed in Illinois for more than 20 years in the election of members of the state legislature. It is to bring once more the evils of misrepresentation, the possibilities of representation of minorities, and the theory and practice of cumulative voting before the public and especially before the Constitutional Convention of the State of New York, now in session, that Mr. Forney has written this little book. The whole matter is knotty and debatable, and it is a subject on which the wisest and the purest statesmen hold different opinions. Mr. Forney has made it very plain, for he has a gift of clear writing, as is well-known to many readers of the *Railroad Gazette*, and to the tens of thousands who have studied the lucid pages of the "Catechism of the Locomotive." The chapters cover representation, misrepresentation, the evils of majority representation and the representation of minorities. Then follow a description of the theory of cumulative voting and copious illustrations of the practice and results, from the experience of the State of Illinois. The volume contains so many quotations from various writers on the subjects treated that it becomes a good index to the literature of the discussion, but in itself it is complete enough for the uses of most citizens, and gives them the material for forming an intelligent judgment on a very important matter.

TRADE CATALOGUES.

Automatic Block Signaling is the title of a pamphlet issued by the Union Switch and Signal Company. We call it a catalogue, because it gives cuts of the automatic disk and semaphore signals made by the company, and elaborate colored diagrams showing how the signals on a series of block sections stand at different stages before and behind a train; but the pamphlet is issued in the form of a letter, which seems to have been addressed to railroad officers and others interested in signaling. The opening paragraph announces that other manufacturers are infringing the company's patents and that a suit has been brought against the Hall Company. Among the colored illustrations of the clock work signals appear three showing the Hall pattern, from which it is to be assumed that the Union Company is prepared to make that kind, though we see no statement to that effect. Two of the diagrams show automatic signals in the normal at danger position, but no diagrams of electric circuits are shown. In connection with the electro-pneumatic system a drawing is shown of an iron semaphore post in which the pneumatic cylinders and pistons are placed inside the post, at the bottom. They are connected with the semaphore arms by rods.

Accompanying this pamphlet is a copy of the letter sent by Mr. Westinghouse to the American Railway Association last spring, when the committee of that association was making its report on block signaling. This letter contains diagrams of the electrical connections of the pneumatic system, and a brief summary of the records of these signals on the Pennsylvania Railroad between Pittsburgh and Wilkinsburg.

Westinghouse Stopper Incandescent Lamp. Westinghouse Electric & Manuacturing Co., Pittsburgh, Pa.

In a very pretty pamphlet the Westinghouse Manufacturing Co. describes its two-part lamp and asks attention to some of the facts relating to the incandescent lamp situation. As a result of considerable litigation injunctions were obtained after the final decision of the Circuit Court of Appeals in October, 1892, restraining most manufacturers of the all glass globe form of lamp from further infringement. The Westinghouse Company went seriously to work to develop the two-part lamp and to manufacture it in competition with the all glass form. The company claims that the failure to establish an absolute monopoly in the manufacture and sale of lamps is almost wholly due to this step and to the successful working of the two-part lamp at the World's Fair. It is claimed that the economy of the lamp now offered to the public is so much greater than that of the all glass form in general use that customers could afford to pay a considerably higher price for it, but in accordance with the established policy of the company a low price is made and liberal allowance for the return of burnt-out lamps. The pamphlet contains some interesting history of the early steps in the contract for World's Fair lighting, and gives description and illustrations of the stopper lamp.

University of Illinois.—The annual catalogues of this institution shows an increase in attendance during the past year as well as an increased capacity for instruction. The attendance for the past year was 743, an increase of 4 per cent. over the preceding year, and of 6 per cent. over the average for the previous ten years. The marked increases have been in the various engineering courses, the total number enrolled in all branches being 399, of which 68 are credited to the department of mechanical engineering, 123 to electrical engineering, 86 to civil engineering, 5 to municipal and sanitary engineering, 2 to mining engineering, 101 to architecture and 14 to architectural engineering. The number of students pursuing architectural studies is said to be greater than at any other collegiate institution in the country.

Engineering (London), in its issue for July 27, devotes no less than 45 pages to descriptions of shops and factories in Manchester and vicinity, the occasion being the meeting of the Institution of Mechanical Engineers in that city which was to be held the following week. The larger part of the article is taken up with an exhaustive description of cotton mills and cotton machinery, with beautiful direct process cuts and including a bit of a historical sketch. Machinery built by different important firms is described in great detail. There is also considerable description of iron and wood-working machinery, including the products of shops at Rochdale.

The Best Light for City Railroad Cars is the title of a handsome little pamphlet issued by the Safety Car Heating & Lighting Co., to recommend the Pintsch gas for street cars. Photographic views are given showing the exterior and interior of street cars containing Pintsch lamps. It is stated that nearly 850 cable and elevated cars are now equipped with the Pintsch light, principally in New York and Chicago, and the application of the light is being extended to electric cars, as mentioned in the last issue of the *Railroad Gazette*. Its use is said to be found more satisfactory and economical than the use of electric light derived from the power current.

American Railway Master Mechanics' Association.—Report of Twenty-seventh Annual Convention.

The report this year fills 310 pages and Secretary Sinclair has got it out in a little over a month, beating his own excellent record for promptness. The editing has, however, been done with great care, so far as we can see. The principal subjects this year are cracking of back

tube sheets, smoke boxes and exhaust nozzles, standard specifications for firebox steel and standardizing the methods of shop tests of locomotives.

The Stirling Co., Chicago, Ill., manufacturers of the Sterling water tube safety boiler, has recently issued a catalogue setting forth the advantages and merits of its boiler, and giving testimonials from a large number of users The long list of parties who are using the boilers furnishes good evidence of their popularity.

THE SCRAP HEAP.

South American Notes.

A concession for a Decauville Railroad from Montevideo, Uruguay, to San José, for conveying goods only, has been sanctioned.

We have already noted the order for sixty locomotives for the Central Railway of Brazil with the Brooks Locomotive Works. Additional orders for rolling stock for this road, which is owned by the government, will soon be given out, the sum of 5,000 contos of reis having been appropriated for this purpose. Large appropriations have also been made for constructing telegraph lines in the states of Matto Grosso and Paraná.

That progressive Brazilian railroad, commonly known as the Mogyana line, has now continued its tracks from Uberaba as far as the river of that name, and will soon have through connection to Saõ Pedro to Uberabinha. There is also a project on foot for the building of a new line of railroad from Uberaba to Fructal.

The stage coach line across the Andes beween Argentine and Chili is now in service from the Argentine terminus of the Transandine Railroad to the Cumbre, or summit, thus reducing the mule journey between the section of the railroads to one hour and a half.

The *Gaceta de los Ferrocarriles*, of Havana, gives the Cuban railroad companies a sound lecture on the necessity of replacing their antiquated passenger equipment with new American cars, provided with modern comforts and conveniences. It points out particularly that the large increase in the number of tourists from the United States every winter renders such improvements absolutely necessary.

The contract between the Argentine Government and the firm of Lucas Gonzalez & Co. for the construction of the railroad from Dean Funes to Chilecito, and from Salta to Cobra Corral, has been rescinded, and compensation to the contractors is to be awarded by a board of arbitration.

The Argentine Department of Public Works has been authorized to invite bids for the construction of branch lines of railroad to Rioja, and to Las Escaleras, as soon as the surveys and studies are complete.

The Sanitary Works Committee of Buenos Ayres has taken charge of and arranged to complete, the sanitary improvement works in that city. It has also taken under its control the large water tower in Cordoba street. The weight of iron in this structure is said to be double that of the Eiffel Tower. It is 40 meters high, and will hold 71,663,000 litres.

The city of Ubá, in the state of Minas, Geraes, Brazil, has been authorized to raise a loan of $80,000 for waterworks.

The work of construction on the Cartagena-Magdelena Railroad, Colombia, has been finished, but the line will not be opened to general traffic until after the summer rains are ended.

The recent message of President Peña to the Argentine congress says, concerning railroads: "The railroad lines throughout the Republic amount to 13,134 kilometers (8,143 miles), representing a capital of $399,457,906 gold. No important center, with the exception of La Rioja, remains now unconnected by a railroad with the rest of the Republic, and arrangements have already been made to connect La Rioja.

Of the capital invested, $42,107.501 correspond to lines owned by the nation; guaranteed lines, $83,259,321; private companies, $224,717,783; and lines guaranteed by provinces, $49,373,300. During the year 1893 the number of passengers carried was 12,969,145; freight carried, 6,295,992 tons; and parcels and baggage, 64,094 tons, an increase over 1892 of 1,381,562 passengers and 3,988,320 tons of freight. The gross receipts amounted to $66,723,326, against an expenditure of $39,338,490. At the end of 1893 $8,732,205 gold was owed by the Government to the guaranteed railroads, against, $17,596,219 owed by them to the Government.

Lake Freight Notes.

Iron ore freights on the lakes are looking up, and the vessel rate on all classes of goods is expected to advance soon. Lumber has touched the bottom notch the past week in a rate of $1.40 per 1,000 ft. from Duluth to Buffalo. From Duluth and Ashland, near by, over 150,000,000 ft. of lumber have been shipped by water this season. It is expected that the shipments of the two places will reach at least 350,000,000 ft. for the season. The fires in lumber at Chicago, Minneapolis and in the Wisconsin towns, where at least 200,000,000 ft. were destroyed, will stimulate rail shipments from all the northwestern markets to some extent.

Shipments of iron ore from Duluth for the season to date have been 525,000 tons; from Two Harbors, in the Duluth district, 800,000 tons; from Ashland, where Gogebic shipments are made, 755,000; from Marquette, about 500,000. Escanaba, on Lake Michigan, has shipped nearly 400,000. The Chicago & Northwestern road handles all the Escanaba ore and two-thirds of the Gogebic; the Duluth & Iron Range, all from Two Harbors; the Duluth, South Shore & Atlantic, all from Marquette; the Duluth, Missabe & Northern, all from Duluth, and the Wisconsin Central, one-third from the Gogebic.

The best ore loading record of the lakes was made last week at Duluth. A total of 1,760 gross tons was loaded into a vessel in 45 minutes, and the trimming occupied but 15 minutes longer. On another vessel at the same dock 3,100 tons was loaded, no trimming being required, in 90 minutes.

For the Convenience of Sleeping Car Passengers.

A new system of procedure to be followed by conductors on the Vanderbilt roads will be brought into service on several trains on the Boston & Albany, New York Central, Lake Shore, and Big Four roads. It is intended to provide for the collection of tickets by the conductor of the train without bothering the passengers more than once or possibly twice. One of the most annoying things in American railroad long-distance travel is the fact that tickets have to be shown on every division to a new conductor. The new arrangement provides for an envelope in which the transportation tickets of all the passengers in each car are to be placed, with pasters on the back showing to whom the tickets belong, and an identification card as a further precaution. The passenger gives up his entire ticket, which is kept in the envelope of his car, and this envelope is turned over by each conductor to his successor. When the passenger makes a change, his tickets are returned to him before he leaves the train. Any mistake, however, on the part of the conductor, might land the passengers in a serious predicament. [As, for instance, in a case like that on the Missouri, Kansas & Texas some time ago, where an envelope containing about 50 tickets was laid down in the smoking room and a few minutes later was found to have mysteriously disappeared and was never found.]

The foregoing from a Buffalo paper is good "news" if it is new; but such a convenience ought not to be new.

The Philadelphia Ship Canal.

The proposed ship canal is a chimera. We have now 27 feet of water in the channel of the Delaware River, which is equal to the depth of water going into New York harbor; and with an expenditure of from two to three hundred thousand dollars the present channel could be deepened to 30 feet. As it would only be necessary to dredge three or four shoal places in the present channel, this work could be finished within a year. Philadelphia would then possess a waterway to the ocean the finest in the world, with a depth of water which would permit the largest vessel afloat to come to her wharves without a stop or a halt for tides. With the present channel of the Delaware River deepened to 30 feet, the city would be but seven to eight hours from the sea. To concede every claim possible for the proposed catboat canal, it would require double that time for vessels to reach our wharves from the ocean. The projectors of the proposed scheme across New Jersey have lost sight of the delays in passing through the locks of a canal, as well as of the slowness of speed necessary in order to prevent damage to the canal embankments. Four miles an hour is the present maximum speed permitted, and at this rate a vessel would require from nine to ten hours to reach the city; and with its draught limited to 20 feet.—*Philadelphia Record.*

Locomotive Building.

The Brooks Locomotive Works of Dunkirk have shipped two locomotives to the Toledo & Ohio Central.

The Pennsylvania has given orders to have eight class "R." locomotives built at the Altoona shops.

The St. Louis, Chicago & St. Paul is about to place an order with the Cooke Locomotive and Machine Co., of Paterson, N J., for two four-wheel coupled locomotives, for delivery by September 15.

BRIDGE BUILDING.

Covington, La—The Penn Bridge Co. has commenced the erection of the iron parish bridge across the Bogue Falaya river at this point.

Millerstown, Pa.—The Pennsylvania Railroad has commenced work on a new iron bridge to replace the old Raccoon creek structure.

Milwaukee, Wis.—Application has been made to the City Council by the Park Board for an appropriation of $40,000 to build two iron bridges in Lake Park. The committees on Finance and Parks have the application under consideration.

New Brunswick, N. J.—The Board of Freeholders of Middlesex county has engaged George H. Blakely, engineer of the Passaic rolling mills at Paterson, as consulting engineer to draw up plans for a new bridge across the Raritan river at Raritan Landing, above New Brunswick. The old bridge at this landing was burned down last fall after standing for nearly 70 years. A contract for a new bridge was awarded to the Berlin Iron Bridge Company for $29,495, but an effort was made to have the contract set aside on the ground of its be ing excessive. During the hearing the company surrendered the contract and the board rescinded it. Mr. Blakely testified that the bridge could be built for about $18,000.

New Philadelphia, Pa.—The contract for a new steel bridge at this point has been awarded to the Pottsville Bridge Co. at their bid of $969. The other bidders were: Nelson & Buchanan Bridge Co., $1,020; Toledo Bridge Co., $983; Masillon Bridge Co., $975; Groton Bridge Co., $1,013; Horseheads Bridge Co., $999.

Philadelphia, Pa.—Contracts for building three new bridges have been awarded by Director Windrim, of the Department of Public Works, the most important being for the bridge over the Schuylkill river at the Falls. Porter & Filbert secured this contract, their bid being $248,500, to complete the work in five months. Councils appropriated $300,000 for the construction of the bridge, and as this is not enough to complete a double-decked structure as at first intended, a single-decked bridge will be built, so arranged that the second decks may be added at any time. The Phoenix Bridge Co. received the contracts for building the bridge over the Pennypack creek at Torresdale avenue for $43,056, and McShale & O'Connor the contract for the Wyoming avenue aqueduct bridge over the Frankford creek for $70,000. The first is to be finished in four and the latter in six months.

Rochester, N. Y.—The Council has plans under consideration for building bridges over the Erie Canal at Exchange and Emerson streets.

Scranton, Pa.—A bridge to cost $700 will be built over the Lehigh River in Clifton township. The Roaring Brook bridge ordinance has passed Select Council. The plans have been completed by City Engineer Phillips. The approximate cost for the superstructure is $82,500; for the substructure $17,250. The total length will be 901¼ ft. The roadway will be 38 ft. clear, with a nine-foot sidewalk on each side. The elevation over the Delaware, Lackawanna & Western tracks will be 21 ft. clearance; over the north side of the reservoir 53 ft. The bridge will be a through Pratt truss structure. There will be seven spans, varying in length from 88 ft. to 210 ft., with small girders of 8 ft. between. There will be six through spans and one deck span.

Slatington, Pa.—Bids were opened last week for the erection of an iron bridge over Trout creek, and the contract for building the bridge was awarded to the Variety Iron Works of Cleveland, Ohio for $770.

Syracuse, N. Y.—Plans are being considered for building a new bridge over the Erie canal at Salina street to replace the present structure.

Toledo, O.—The Consolidated Street Railroad Company has placed an order with the Toledo Bridge Company for an iron trestle to carry its railroad over the tracks of the D. & M. Railroad in order to connect with the Toledo & Maumee Valley Railway.

Turner, Me.—The new iron bridge across the Androscoggin at Turner, Me., has been completed. The bridge was put in by the Berlin Bridge Co. It is a four-span iron bridge 400 ft. long. The total cost will be about $6,500.

Williamsport, Pa.—Last week the County Commissioners sold all the iron bridges swept away in the May flood. The four spans of the Muncy bridge, estimated to contain 150 tons of iron, were sold for $4.80 per ton to the Horseheads Bridge Co. of Horseheads, N. Y.; three spans of the Jersey Shore bridge, 150 tons, were purchased by the Keeler Co. of Williamsport, Pa., at $5.35 per ton; one span of the Market street bridge, containing 45 tons, sold to Oehischlager & Montz, at $3.75 per ton, and one span of the Field's Station bridge, containing 25 tons, sold to the Horseheads Bridge Co. at $5.10 per ton.

York, Pa.—Viewers have been appointed on a proposed new county bridge over Codorus creek in Seven Valley Borough.

RAILROAD LAW--NOTES OF DECISIONS.

Powers, Liabilities and Regulation of Railroads.

The Supreme Court of Missouri lays it down that the construction and operation by a railroad company of a part of its road proves an acceptance of its charter, where no particular mode of acceptance is designated [1].

In New Jersey, the Court of Errors & Appeals holds that the statute which provides that all property of any railroad company "used for railroad purposes" shall be assessed by a state board of assessors, the authorized right of way of a railroad, duly acquired, over which a road has been constructed, and is in good faith operated, is used for railroad purposes, though it may not, for the time being, be wholly occupied by tracks, or other railroad appliances [2].

The Supreme Court of Mississippi holds that where a county votes bonds in aid of a railroad company on the agreement by the company to maintain its road as a permanent structure at a certain point, a property owner is not a party to the contract, and cannot sue the company for a breach thereof [3].

The Court of Appeals of Kentucky, decides that railroads which began the construction of their roads after the statute of 1884, exempting newly-constructed railroad property from taxation, was repealed by the statute of 1886, cannot claim exemption from taxation under the act of 1884, on the ground that they did such construction work in the belief that such act was still in force. But that the act of 1856, reserving to the legislature the right to repeal or amend "charter privileges" granted by the legislature, to particular persons, does not enable the legislature to repeal an act exempting newly-constructed railroad property from taxation for a certain time, as against railroad companies which, on the faith of such act constructed their roads before it was repealed [4].

In the Supreme Court of the United States it is held that where a State constitution permits counties to donate their bonds, not exceeding a certain percentage on the assessed valuation, to railroad companies, a donation in excess of the prescribed percentage is void in toto; and the bondholders have no equity to recover any amount whatever on the theory that the county received a consideration in the construction of the railroad, and should therefore pay so much on the bonds as it might lawfully have donated [5].

In the Federal Court it is held that a contract between railroad acompanies forming a freight association that they will establish and maintain such rates, rules, and regulations on freight traffic between competitive points as a committee of their choosing shall recommend as reasonable; that these rates, rules, and regulations shall be public; that there shall be monthly meetings of the association; that each company shall give five days' notice before some monthly meeting of every reduction of rates or deviation from the rules it proposes to make; that it will advise with the representatives of the other members at the meeting relative to the proposed modification, will submit the question of its proposed action to a vote at that meeting, and, if the proposition is voted down, that it will then give ten days' notice that it will make the modification notwithstanding the vote before it puts the proposed change into effect; that no member will falsely bill any freight, or bill any at a wrong classification; and that any member may withdraw from the association on a notice of thirty days—is not a contract or conspiracy in restraint of trade under the anti-trust act when the rates maintained under the same have been reasonable, and the tendency has been to diminish, rather than to enhance, them [6].

A statute of Indiana provides that the state board of health may adopt rules in relation to the public health, to prevent outbreaks and the spread of infectious diseases. Rule 5 of the board, concerning the transit of dead bodies, provides that every body must be accompanied by a person in charge, having a transit permit from the board of health, showing name of deceased, age, place of burial, cause of death, and, if of an infectious nature, the point to which it is to be shipped, medical attendant, and name of undertaker. The Court of Appeal holds that the name of the medical attendant was a material part of the transit permit, and, where such name was not contained in a permit presented to defendant railroad company, its refusal to carry the body, was not wrongful [7].

The Supreme Judicial Court of Massachusetts decides that the statute of 1892, requiring every railroad company to sell 1,000 mile passenger tickets for $20, to redeem such tickets on presentation by any other company, and to accept for fare over its own lines all such tickets issued by any railroad company operating within the state, is unconstitutional, as authorizing one railroad to determine the conditions on which another railroad must carry passengers [8].

In Kansas the Supreme Court rules that where two or more railroad companies are consolidated under the statutes of the state, the new or consolidated company is answerable for the obligations of the old companies, including torts, in the absence of any evidence or stipulations to the contrary [9].

Carriage of Goods and Injuries to Property.

In Illinois the Plaintiff shipped corn by rail, consigned to himself, with directions to notify a cetain party at the point of destination, on which party plaintiff had drawn for the corn, attaching the bill of lading to the draft. The drawee wrote plaintiff that he was not able to pay the draft on presentation, whereupon plaintiff made a second draft, on 10 days' time. The railroad company, in the mean time, had stored the corn with a warehouseman, taking a warehouse receipt therefore in its own name. The Supreme Court holds that the company's liability as common carrier ceased upon its delivery of the corn at the warehouse, although it had failed to notify plaintiff of the drawee's failure to receive the corn, since the plaintiff had notice from the drawee, and there therefore remained nothing to be done to complete the contract of carriage [10].

In Texas the Supreme Court rules that the receipt of freight by one carrier from another, to forward to point of destination, does not bind the receiving carrier to the terms of the contract made by the first carrier with the shipper; such terms not being known by the receiving carrier, and

there being no partnership relation between the carriers [11].

The Supreme Court of Minnesota, holds that an insurance policy insuring a railroad company on account of its liability as carrier and warehouseman does not cover a liability arising from a contract by such company to insure goods in its custody for the owner's benefit [12].

In Texas it is laid down that a consignee who refuses to accept goods on the ground of delay in delivery by the carrier cannot be held liable for demurrage and storage fixed by the rules of the carrier, of which he had no notice, unless the rates of demurrage and storage are shown to be reasonable [13].

The Supreme Court of Nebraska holds that the term "surface water" includes such water as is carried off by surface drainage, and for the construction of an embankment proper for railroad purposes, which deflects such surface water from its normal course, a railroad company is not liable to the proprietor of neighboring lands thereby incidentally overflowed [14].

Injuries to Passengers, Employees and Strangers.

In Pennsylvania the crew of a freight train placed several loaded cars on a side track, securely tightened the brakes, and threw off the switch, so as to prevent the cars from getting on the main track, and so as to derail them, if they did get loose. A boy, not in any way connected with the railroad company, turned back the switch, opened the brakes with a hammer, detached two of the cars, and started them down the side track. They reached the main track, and within a very few minutes collided with a passenger train, killing several passengers and injuring others. The Supreme Court holds the railroad not liable [15].

In the above case the court lays it down that the rule that a carrier of passengers is bound to exercise the highest degree of care that is possible to human foresight and prudence does not make the carrier an insurer against accidents, nor require it to prevent an accident by the employment of means which, if the accident could have been foretold, might have been used to prevent it; nor does the rule render the carrier liable fo the wrongful acts of strangers unless the carrier was remiss in not discovering them in time to avert the injury; nor is the carrier required to exercise an impracticable character or extent of precaution which could not be observed without so serious a cost as to destroy the business and in all cases the liability is only such as results from negligence [16].

In Michigan the plaintiff purchased from defendant railroad company a ticket consisting of several coupons. After traveling the distance represented by the first coupon, he changed cars. On presenting the ticket to the second conductor, it was discovered that the second coupon was missing, and plaintiff informed him that it had been taken up by the first conductor. Plaintiff would not pay his fare, and was ejected from the train. He afterward bought a ticket, and completed his journey. The Supreme Court rules that plaintiff could recover only the value of the coupon taken up by the first conductor. [17]

The Supreme Court of Pennsylvania rules that where a passenger was killed in an accident caused by a rock becoming detached from a hillside, and falling on the train, the burden of proof to show negligence is on plaintiff, the accident being disconnected with the appliances and operation of the road. [18]

18 Fleming v. Pitts. C C & St. L., 27 Atl. Rep., 858.

In Mississippi the Supreme Court holds that an intending passenger, who waits at a place 250 feet behind the station house till after his train has whistled, and then runs around the station house, where there is no platform, just in front of the train, and is knocked over by the engine, himself causes his injury, though the train is being run at an illegal speed. [19]

In Michigan the Supreme Court rules that where the trainmen, on leaving a station, announce the next station, there is no negligence in failing to state that the train will stop at a railroad crossing before it reaches the next station; and therefore the company is not liable to a passenger who, without the knowledge of the trainmen, attempted to leave the train when it stopped at the crossing, thinking it was the station announced, and was injured thereby. [20]

In New Jersey the Plaintiff bought an excursion ticket from R. to M. and return, "via B. Branch," "not good to stop off en route." The road from R. to B., where it was necessary to change trains, was the main line; and from B. to M., the B. Branch. On his return from M., he would, if trains were on schedule time, have had to wait in the B. station a half hour for a train to R. A half mile from B., however, his train had to wait to let a belated train pass. Plaintiff there left his train, and walked to B., getting there in time to board the belated train. The Supreme Court holds that this train not being a connecting one his ticket was not good on it. [21]

In a case in the Fedral Court the death of a brakeman was caused by his train being struck by two "live" engines, which had run away from the railroad yard, it appeared that the engines had been left in the yard after the days' run; that they and another engine were cared for by the only person on duty in the yard; that after the examination of the engines in question, and while such person was working on the other engine, about 75 yards distant, the two engines moved away; that the night was dark, and objects were not discernible a distance of over 30 feet. The Court holds that the railroad was liable for failure to take reasonable precautions to provide against the engines being put in motion of themselves or by outside persons. [22]

In New York it appeared that at a station while a brakeman was setting a brake on a flat car, the brake rod came out because of the absence of a pin in the lower end, causing him to fall. The brake had not before been used after the train was made up, and the absence of the pin could not be seen by a person setting the brake, but could by inspection under the car. There was no indication that the pin was displaced by the effort to set the brake, and there were indications that it could not have fallen out as the result of the car's motion. The Court of Appeals rules that the Court should have submitted to the jury the question whether or not the railroad had used reasonable care in the inspection of the brake. [23]

The Supreme Court of Pennsylvania rules that a railroad is not negligent in failing to inform one of its experienced engineers, who has run over its road for many years, and who was appointed to instruct an engineer on another engine in all the physical peculiarities of the road, that such engine is several inches wider than the one he had been accustomed to handle; and he cannot, therefore, recover for injuries sustained by his head coming in contact with the iron work of a bridge while leaning out of the cab window watching his train, though he could safely have done so on the old engine. [24]

1 Roosa v. St. Joseph & I., 21 S. W. Rep., 1124.
2 U. N. J. R. & C. Co. v. Jersey City, 26 Atl. Rep. 135.
3 Baird v. Ga. Pac., 12 South. Rep., 547.
4 Com. v. O. F. R. & G. (Ky.), 23 S. W. Rep., 868.
5 Hedges Dixon Co., 14 S. C. Rep., 71.
6 U. S. v. Trans. Mo. Freight Asso., 55 Fed. Rep., 58.
7 L. E. & W. Ry. Co. v. James, 35 N. E. Rep., 395.
8 Attorney General v. B. & A., 35 N. E. Rep., 252.
9 Berry v. K. C., Ft. S. & M., 34 Pac. Rep., 805.
10 Gregg. v. Ill. Cent., 35 N. E. Rep., 343.
11 M. K. & T. v. Stoner, 23 S. W. Rep., 1020.
12 Minn. St. P. & S. S. M. v. Home Ins. Co., 56 N. W. Rep., 815.
13 Baumbach v. G., C. & S. F., 23 S. W. Rep., 693.
14 Morrissey v. C. B. & Q. R. Co., 56 N. W. Rep., 946.
15 Fredericks v. Northern Central, 27 Atl. Rep., 689.
16 Ibid.
17 Van Dusan v. Grand Trunk, 56 N. W. 848.
18 Fleming v. Pitts, C. C. & St. L., 27 Atl. Rep., 858.
19 Crawley v. R. & D., 13 South. Rep., 74.
20 Minock v. D., G. H.-& M., 56 N. W. Rep., 780.
21 Penn. Co. v. Parry, 27 Atl. Rep., 914.
22 So. Pac. v. Lafferty, 57 Fed. Rep. 536.
23 Bailey v. R. W. & O. R. Co., 34 N. E. Rep., 918.
24 Bellows v. Penn Co., 27 Atl. Rep., 685.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago & Alton, quarterly, $2 per share on the common and preferred stock, payable Sept. 1.

Cleveland & Pittsburgh, quarterly, 1¾ per cent. on the guaranteed stock, payable Sept. 1.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Chicago, Milwaukee & St. Paul, annual, Milwaukee, Wis., Sept. 22.

New York Susquehanna & Western, annual, Jersey City, N. J., Sept. 6.

Wabash, annual, St. Louis, Mo., Sept. 11.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *General Baggage Agents* will hold their semi-annual convention at Montreal on Aug. 15.

The *Roadmasters' Association of America* will hold its annual convention in New York city beginning Sept. 11 and lasting three days. The first meeting will be held in Tammany Hall and the following ones at the Broadway Central Hotel which will be the headquarters of the Association.

The *New England Roadmasters' Association* will hold its annual convention at the American House, Boston, Mass., Aug. 15 and 16.

The Master Car & Locomotive Painters', Association will hold its annual convention at Buffalo, N. Y., on Sept. 12, 13, 14. The headquarters will be at the Genessee Hotel.

The *Western Railway Club* meets in the rooms of the Central Traffic Association, Monadnock Building, Chicago, on the third Tuesday in each month, at 2 p. m.

The *New York Railroad Club* meets at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York city, on the third Thursday in each month, at 8 p m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Wednesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the fourth Wednesday of January, March, April, September and October.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Northwestern Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, at 8 p. m.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m.

The *Western Society of Engineers* meets on the first Wednesday in each month, at 8 p. m. The headquarters of the society are at 51 Lakeside Building, Chicago.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m.

The *Boston Society of Civil Engineers* meets at Wesleyan Hall, 36 Bromfield street, Boston, on the third Wednesday in each month, at 7.30 p. m.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Engineers' Society of Western Pennsylvania* meets in the Carnegie Library Building, Allegheny, Pa., on the third Tuesday in each month, at 7.30 p. m.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Denver Society of Civil Engineers* meets at 36 Jacobson Block, Denver, Col., on the second and fourth Tuesdays of each month except during July, August and December, when they are held on the second Tuesday only.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7.30 p. m.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 24 West Fourth street, Cincinnati, O., on the third Thursday in each month, at 7:30 p. m. Address P. O. Box 333.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday in each month, at 8 p. m.

The *Foundrymen's Association* meets at the Manufacturers' Club, Philadelphia, Pa., on the first Wednesday in each month.

The *Association of Engineers of Virginia* holds informal meetings on the third Wednesday of each month, from September to May, inclusive, at 710 Terry Building, Roanoke, at 8 p. m.

Southern and Southwestern Railway Club.

The next meeting of the Southern and Southwestern Railway Club will take place at the Kimball House, Atlanta, Ga., on Thursday, August 16, at 1 o'clock a.m. The subjects for discussion will be: (1) "Counterbalancing of Driving Wheels;" with special committee, Messrs. R. P. C. Sanderson, L. R. Pomeroy, T. W. Gentry and A. W. Gibbs; (2) "Air-Brake Defect Cards;" with special committee, Messrs. A. B. Corinth, W. T. Hamar and A. T. Hooker; (3) "Draft Sheets, Best Forms for Economy of Fuel;" with special committee, Messrs. Jno. B. Michael, W. H. Owens and C. B. Gifford; (4) "Is there a Permanent Careening of Passenger Truck Bolsters, and if so, What is the Remedy?" with special committee, Messrs. J. D. McPhail, R. D. Swisher and W. H. H. Price.

New England Roadmasters' Association.

The officers announce that Mr. Joseph T. Richards, M. Am. Soc. C. E., Engineer of Maintenance of Way, Pennsylvania Railroad, will address the members of the association at eight o'clock on Wednesday evening, August 15, at the American House, Boston. The subject will be the "Rebuilding of the Pennsylvania Railroad after the Johnstown Flood." About thirty lantern slides will be presented.

Mr. T. A. Mackinnon, General Manager Boston & Maine Railroad, has extended to the members of the association the courtesy of providing special cars for an excursion over the York Harbor & Beach Railroad, via the Eastern Division B. & M. R. R. to Portsmouth. The special cars will be attached to the regular 1.15 express train from Boston, August 16, arriving at York Beach at 3.40. Returning will leave York Beach at 5.50 and arrive in Boston at 8.30. Other portions of the programme for this convention were published in this column on July 27.

Railway Contracting Freight Agents.

The ninth annual meeting of the National Association of Railway Contracting Freight Agents will be held at the International Hotel, Niagara Falls, N. Y., on Monday, August 13, at 10 a. m., eastern time. After the business of the meeting an excursion is planned to Toronto, Kingston, Thousand Islands and Montreal; thence south to Bluff Point, Lake George, Saratoga and back to Buffalo, arriving there 6 p. m. Saturday, August 18. Milton Jones is President of the Association, and S. Gans, Jr., Buffalo, is Secretary and Treasurer.

Roadmasters' Association of America.

The twelfth annual convention of the Roadmasters' Association of America will meet in New York City September 11, 1894, and will continue in session three days. Committees have been appointed and reports will be submitted on the following subjects: "Records and Reports of the Maintenance of Way and Departments," Charles S. Churchhill, Norfolk & Western R. R., chairman; "Track Joints," J. M. Meade, A., T. & S. F. Railway, chairman; "Standard Track Tools," G. W. Merrill, chairman; "Inspector and Distribution of Track Ties," Garitt Davis, B. C. R. & N. R. R., chairman. Papers will also be submitted in competition for *The Railway Age* premium of $200 on the subject, "Best Methods and Appliances for Clearing Wrecks." The convention headquarters will be at the Broadway Central Hotel, 667 Broadway, where special rates have been secured. The business meetings will be held in a hall in the hotel. The openingsession will be in Tammany Hall, after which all business will be transacted at the hotel. The Committee on Arrangements, of which Robert Black, of the Manhattan Elevated, is chairman, has prepared a programme for the entertainment of the members and their wives, which will not, however, interfere with the regular order of business, which is held to be of first importance. No arrangements will be made by the association for transportation of members, as it is considered impracticable to do so, but a circular has been issued to superintendents and managers, requesting them to secure for delegates from their respective roads transportation to and from New York.

PERSONAL.

—Mr. W. R. Busenbark, formerly Traffic Manager of the Chicago Great Western, has been elected President of the Baldwin Brothers Company of New York city.

—Mr. Justus M. Hogeland, Assistant Engineer of the Brainerd & Northern Minnesota Railroad, now building in northern Minnesota, died at Brainerd, Minn., on July 27.

—Mr. H. M. Pearce, First Assistant General Freight Agent of the Chicago, St. Paul, Minneapolis & Omaha Railroad, has resigned, the resignation to take effect August 10.

—Mr. George W. Stimson, Purchasing Agent of the Cleveland, Cincinnati, Chicago & St. Louis road, has resigned the office and has been succeeded by Mr. A. M. Stimson as the Acting Purchasing Agent.

—Mr. F. H. Coolidge, Southern Agent of the American Brake Co., has resigned his position with that company to go into the railroad supply business. Mr. Henry A. Wahlert, formerly agent at St. Louis Mo., will hereafter look after the company's business in the Southern States, with his office at room 544 Equitable building, Atlanta, Ga.

—Mr. C. E. Turner was this week appointed Superintendent of Motive Power of the Buffalo, Rochester & Pittsburgh to succeed the late Mr. W. T. Small. Mr. Turner goes to this road from the Western New York & Pennsylvania where he has been Division Master Mechanic some years, his headquarters being at Olean, N. Y.

—Mr. E. M. Reynolds, who has been Auditor of the Lehigh & Hudson River Railroad in New York State, has been recently appointed Purchasing Agent of the line, and Mr. George P. Harris has been appointed Engineer of Maintenance of Way, his former title having been Superintendent of Tracks, Bridges and Buildings. He is also assistant to the President.

—Mr. James McGee, formerly Master Car Builder of the Houston & Texas Central Railroad, has recently been appointed Acting Superintendent of Motive Power and Machinery of that railroad. This is a new office created on August 1, when the machine shops and car shops were consolidated into one department under the direction of a superintendent of motive power.

—Mr. H. O. Nourse, at one time the Chicago representative of the Scarritt Car Chair and Seat Company, has again taken a position with this well-known St. Louis concern in the railroad and street railway department, with office at No. 941 The Rookery, Chicago. Mr. Nourse is also manager of the Smith Locomotive Fire Kindler Company, with headquarters as above.

—Mr. C. H. Hudson has been appointed General Manager and Col. C. P. Minetree has been appointed Purchasing Agent of the Memphis & Charleston Railroad. This road

is now being operated as an independent line by its receivers. Having been excluded from the terms of the reorgnization plan of the Richmond Terminal it was not included among the lines of the East Tennessee, Virginia & Georgia taken over by the Southern Railway Co. on August 1.

—General John S. Irick, who died at his home in Vincentown, N. J., on August 4, was for over half a century prominent in the business and political affairs of his state. He organized the Camden & Burlington County Railroad and the Vincentown Railroad, and was president of both corporations. He also organized the First National Bank of Vincentown, of which he was president. He was also a Director of the Morris Canal Company, and other railroad and financial corporations.

—Mr. L. H. Clark has been apointed engineer in charge of the work of elevating the tracks of the Chicago, Rock Island & Pacific and the Lake Shore & Michigan Southern Railroads in Chicago, and has already assumed his duties. Mr. Clark was for years Chief Engineer of the Illinois Central and has also held similar positions on the Lake Shore & Michigan Southern and the Sioux City & Pacific. He was City Engineer of Chicago during the administration of Mayor Washburn.

—Mr. David Palmer, recently Vice-President of the City National Bank of New York, but formerly connected with the Philadelphia & Reading Coal & Iron Co., and other corporations affiliated with railroad companies, died in New York on August 4, aged 80 years. Mr. Palmer was, before 1860, connected with the Cumberland Coal & Iron Co., and later was concerned with George B. DeKeim and others in the organization of the Philadelphia & Reading Coal & Iron Co. He became treasurer of that company, resigning in 1877, when he returned to banking business in New York.

—Mr. George W. Layng, freight agent of the Pennsylvania Railroad and the Columbus, Hocking Valley & Toledo, at Toledo, died at his home in that city on July 31, after a brief illness. Mr. Layng has been connected with the Pennsylvania and Hocking Valley companies as agent at Van Wert, Ohio, and at Toledo for nearly twenty-seven years, and for part of that time was also passenger and freight agent of the Toledo, Ann Arbor & North Michigan. He was about 54 years old and leaves a widow and three daughters. Mr. J. D. Layng, General Manager of the West Shore Railroad, is a brother of the deceased. Another brother is Mr. Frank R. Layng of Pittsburg.

—Mr. M. A. Gray, who has been Superintendent of the Georgia Midland & Gulf Railroad since it was opened for operation in 1887, has resigned, and that office will be abolished, the duties being assumed by Mr. C. W. Chears general manager. Mr. Gray has been connected with Georgia railroads for a long period. He has been treasurer of the North & South Bound Railroad of Alabama, now operated by the Louisville & Nashville, superintendent of the Columbus & Rome, and since 1886, superintendent and treasurer of the Georgia Midland Construction Company, which built the Georgia Midand & Gulf Railroad, of which he became superintendent as soon as the road was completed.

—Mr. W. R. Crumpton, who has been General Manager of the Baltimore & Lehigh Railroad since 1891, when that company was formed by the consolidation of the Maryland Central and the York & Beach Bottom Railroad, has resigned that position, the railroad being now operated by Alexander Brown, of Baltimore, as the representative of the bondholders' committee which now controls the property. Mr. Crumpton was formerly Division Superintendent of the Chicago, Burlington & Quincy, and General Superintendent of the St. Louis, Arkansas & Texas, and connected with other western railroads, particularly the Bellaire, Zanesville & Cincinnati, which he was operating as the representative of the bondholders previous to going to the Baltimore & Lehigh.

—Some of the changes in the operating department of the Great Northern Railroad were detailed in this column last week and others are noted elsewhere in this issue. The last changes announced are the resignation of E. B. Wakeman as General Superintendent of Transportation and the appointment of C. H. Cannon to the duties of that position with the title of Superintendent of Car Service. Whether Mr. Wakeman will continue with the company in some other position it is not announced. He has held the office which he has just resigned since 1892. Before that, for 10 years, he was Assistant General Superintendent of the St. Paul, Minneapolis & Manitoba. Like a good many other officers who have held high positions on the Great Northern, he has been connected with the Chicago, Milwaukee & St. Paul. Before going to the Great Northern he was on the Chicago, Burlington & Quincy. In 1879 he became Division Superintendent of the Manitoba road and than Superintendent of Transportation, and in 1882 Assistant General Superintendent. Mr. Cannon's appointment promotes him from the office of Car Accountant. The promotion of Mr. R. I. Farrington, formerly Auditor of Disbursements and Assistant Comptroller, to be Comptroller, has been followed by the appointment of J. L. Cramer as Auditor of Disbursements, and Mr. J. R. Martin as Assistant Auditor of Disbursements. Both of these officers come from the Northern Steamship Co., where one has been General Auditor and the other Assistant Auditor at Buffalo.

ELECTIONS AND APPOINTMENTS.

Altoona & Phillipsburg Connecting.—The present officers of this company are: S. P. Langdon, President, Bullitt Building, Philadelphia; W. T. Forsythe, General Manager; and George M. Case, General Freight and Passenger Agent. The general offices are at Phillipsburg, Centre County, Pa.

Atlantic Coast Line.—F. H. Fechtig has been appointed Purchasing Agent of all the lines included in this system, with office at Wilmington, N. C.

Blue Mountain.—The following is a list of the officers of this company, which has been organized in Pennsylvania: President, Clinton Rorer; Treasurer, George F. Murray; Secretary, Frank Brenton; Chief Engineer, Robt. Frazer, and General Counsel, W. C. Mayne, all having offices at 926 Walnut street, Philadelphia.

Boston & Albany.—N. Wales has been appointed Division Superintendent, with office at East Albany, N. Y.

Boston Elevated.—The formal organization of this company, which is the title under which the Meigs elevated railroad project has secured its charter, was accomplished at a meeting of incorporators at Boston on August 3. The following directors were elected: Gen. Chas. Whittier Gen. Thomas W. Hyde, Willard Howland, Joseph V. Meigs, Theodore W. Myers, Joseph H. O'Neil, George H. Towle. Several places on the board will be filled at some future meeting. Gen. Charles A. Whittier was chosen president; George H. Towle, Vice-President; C. Patch, Clerk; J. Carney, of Lowell, Treasurer; Willard Howland, General Counsel; Joseph V. Meigs, Chief Engineer; Gen. Herman Haupt, Consulting Engineer. The directors chose Gen. Whittier, G. H. Towle and Gen. Thomas W. Hyde members of the Executive Committee. Gen. Whittier, who came originally from Bangor, Me., was for four years a partner with Lee, Higginson & Co., of Boston. Vice-President George H. Towle, of Boston, has been practically in control of the scheme for ten years. Clerk C. Patch is an assistant to George H. Towle in his law office. Treasurer George J. Carney, of Lowell, is Treasurer of the Lowell Institute for Savings. Gen. Herman Haupt, of Washington, is a distinguished engineer. Of the other directors Gen. Hyde is the well known President of the Bath Iron Works; Capt. Meigs, who is to be Chief Engineer, is the inventor of the system. Theodore W. Myers is a banker in New York and ex-Comptroller of that city.

Bristol Branch.—Col. Percival W. Clement, of Rutland, N. Y., has been chosen President of the Bristol Branch Railroad, running from the Rutland Railroad to the village of Bristol.

Brockville, Westport & Sault Ste. Marie.—James G. Leiper has been elected President, with office at Philadelphia, Pa.

Buffalo, Rochester & Pittsburgh.—C. E. Turner has been appointed Superintendent of Motive Power in place of Mr. W. T. Small, deceased.

Calumet & Blue Island.—C. E. Dearnborn has been apponted Chief Engineer with headquarters at South Chicago, Ill.

Chesapeake & Ohio.—W. G. Benjamin, Agent of the Cleveland, Cincinnati, Chicago & St. Louis, at East St. Louis, has been appointed Assistant General Freight Agent of this company, in charge of coal traffic, with headquarters at Cincinnati.

Chesapeake, Ohio & Southwestern.—William P. McDowell has been appointed Purchasing Agent, with office at Louisville, Ky., to succeed W. M. Quarrier.

Chickamauga & Durham.—Paul J. Murphy has been appointed Receiver and J. I. Henderson, Superintendent, both with headquarters at Chickamauga, Ga.

Cleveland, Cincinnati, Chicago & St. Louis.—The office of General Freight Agent, formerly held by A. S. White, has been declared vacant, and Crawford Tillinghast, formerly Chief Clerk to Mr. White, has been appointed Assistant General Freight Agent, with offices at Cincinnati, in charge of the freght traffic of the Chicago division, Lawrenceburg & Aurora branch, Columbus, Hope & Greensburg Railroad, Whitewater division and Cincinnati division.

Eastern Minnesota.—Samuel Hill has been elected President, vice W. S. Alexander, resigned. W. W. Finley has been appointed General Traffic Manager.

Elgin, Joliet & Eastern.—The office of general freight agent, formerly held by A. F. Banks, has been abolished, and Mr. Banks has been appointed Traffic Manager to succeed H. J. Page, who has resigned to engage in other business. Mr. Banks' office will be in the Monadnock block, Chicago.

Flint & Pere Marquette.—J. H. Simpson, formerly car service agent, has been promoted to be Assistant to the General Manager. D. Crombie, Jr., has been appointed Car Service Agent to succeed J. H. Simpson, promoted, both officers having offices at Saginaw, Mich.

Georgia, Midland & Gulf.—M. E. Gray, Superintendent, having resigned, until further notice all communications heretofore addressed to him should be sent to C. W. Chears, General Manager, Columbus, Ga. C. J. Birdsong has been appointed Train Master, with headquarters at Columbus.

Great Northern.—Charles H. Warren, Comptroller, has been appointed General Manager, vice Charles W. Case, resigned. R. I. Farrington has been appointed Comptroller to succeed C. H. Warren, promoted. Edward W. McKenna succeeds R. W. Bryan, resigned, as General Superintendent.

Houston & Texas Central.—A circular has been issued announcing the appointment of James McGee as Acting Superintendent of Motive Power and Machinery, with office at Houston, Tex.

Iowa Central.—J. P. O'Brien having resigned as General Superintendent to enter the service of another company, the position has been abolished. The following appointments have been made:

Mr. J. H. Redmon, Superintendent in charge of transportation, with headquarters at Marshalltown, vice W. H. Voorhies, appointed Assistant Superintendent.

Mr. J. G. Woodworth, General Freight Agent, having resigned to enter the service of another company, the duties of the office will be assumed by the Assistant General Freight Agent until further notice.

Mr. S. M. Rogers is appointed Purchasing Agent of this company, with headquarters at Marshalltown, Iowa.

Lehigh & Hudson River.—E. M. Reynolds has been appointed Purchasing Agent, with office at Warwick, N. Y. George B. Harris, Engineer of Maintenance of Way, has been appointed with office at Warwick.

Memphis & Charleston.—On August 1 the office of the General Passenger and Ticket Agent was transferred to Memphis, Tenn. All communications concerning the passenger business should be addressed to B. W. Wrenn, General Passenger and Ticket Agent, at Memphis, Tenn.

Missouri, Kansas & Texas.— Frank Matthews, Chief Assistant in the office of Division Roadmaster Tibbitts, has been appointed Roadmaster of the San Marcos division, with headquarters at Smithville, Tex. Mr. Matthews was at one time Chief Engineer of the Kansas City, Wyandotte & Northwestern.

New York, Lake Erie & Western.—G. W. Conklin, Trainmaster and Master Mechanic of the Bradford division, has resigned. C. P. Weiss will hereafter have jurisdiction over the Bradford division in addition to his duties as Master Mechanic of the Western division. I. E. McCracken has been appointed Foreman at Bradford, Pa.

Rio Grande & Eagle Pass.—At a meeting held in Laredo, Tex., on July 24, the following directors were elected: J. J. Haynes, D. H. Randolph, F. M. Dick, J. Deutz, Sr., J. Z. Leyendecker, H. C. Smith, P. J. Milan, C. G. Brewster and C. B. Wright, Jr. The directors met later and elected: C. B. Wright, Jr., of Philadelphia, President; D. H. Randolph, Vice-President; P. J. Milan, General Manager, and J. L. Pulliam, Secretary and Treasurer, all with headquarters at Laredo, Texas.

Seattle, Lake Shore & Eastern.—George H. Baxter, of New York City, a member of the board of trustees, has resigned, and Henry C. Rouse, one of the receivers of the company and chairman of the Missouri, Kansas & Texas, has been elected to succeed him.

St. Louis, Chicago & St. Paul.—D. C. Frederick has been appointed Car Service Agent to succeed B. L. Babb, deceased, with office at Springfield, Ill.

Southern Railway Co.—Circulars have been issued announcing the appointments in the traffic department of the company. The appointments for the Eastern System are: S. H. Hardwick, Assistant General Passenger Agent, Atlanta, Ga.; R. D. Carpenter, General Agent, New York City; L. S. Brown, General Agent, Passenger Department, Washington, D. C.; Alexander S. Thweatt, Eastern Passenger Agent, New York City; W. H. Tayloe, District Passenger Agent, Atlanta, Ga.; R. Powers, District Passenger Agent, New Orleans, La.; A. G. Craig, Division Freight Agent, Charlotte, N. C.; D. Cardwell, Division Freight Agent, Columbia, S. C.; L. L. McCleskey, General Agent, Atlanta, Ga.

The appointments for the Western System are: C. A. Benscoter, Assistant General Passenger Agent, Knoxville, Tenn.; J. J. Farnsworth, District Passenger Agent, Atlanta, Ga.; L. A. Bell, District Passenger Agent, Selma, Ala.; J. C. Andrews, General Southern Passenger Agent, Chicago, Ill.; J. Gothard, Division Freight Agent, Knoxville, Tenn.; J. J. Griffin, Division Freight Agent, Atlanta, Ga.; Ray Knight, Division Freight Agent, Selma, Ala.; John L. Meek, Assistant to C. A. Benscoter, with the title of Division Passenger Agent.

RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

Altoona & Phillipsburg Connecting.—President Samuel P. Langdon, of Philadelphia, announces that the recent decision of Judge Metzger, of Williamsport, Pa., in the contest for the control of the Altoona, Clearfield & Northern Railroad, which was decided against Mr. Langdon, will not interfere with the construction and completion of this railroad, which is being built from Phillipsburg Pa., southwest to connect with the Altoona, Clearfield & Northern. Mr. Langdon, if he had been continued in control of the latter road, proposed to make the connection of the Altoona & Phillipsburg connecting road with that line at Wopsonnock, a station about 13 miles north of Altoona. Now he proposes to continue the line into the city of Altoona.

Amsterdam, Johnstown & Gloversville.—Engineers Moak and Miller are rapidly completing the survey of this new railroad. A large number of ties and rails have been distributed along the route surveyed, and the work of building the road, it is expected, will be commenced this month. The road will extend from Akin, near Amsterdam, north to Gloversville, a distance of 10 miles. J. H. McClement, of New York City, is one of the directors.

Arkansas, Texas & Mexican Central.—This company has been incorporated in Texas to build a railroad from a point near the Spanish Fort, on the northern boundary of Montague county, southwest through Montague to a point near Abilene on the Texas & Pacific. The distance is about 150 miles. The incorporators are A. J. Wolverton, J. A. Bivens, P. M. Devitt, A. L. Matlock, W. Boyce and J. C. Weaver.

Atlantic Coast Line.—The officers expect to have the extension of the Manchester & Augusta to Denmark, S. C., on the South Bound Railroad opened for traffic in August. Recent conferences have been held between General Manager J. R. Kenly and the traffic officers of the Atlantic Coast Line and the officers of the South Carolina & Georgia and of the Southern Railway Co., to complete the agreement between the roads. The opening of the Denmark extension will give a new and shorter line to Augusta and other points, the company reaching that town over the South Carolina & Georgia road from Denmark. The South Bound road extends to Columbia, S. C., on the north, and to Savannah on the south.

Bangor & Aroostook.—Some fast railroad building is being done on the extension of this railroad beyond Houlton to Presque Isle in northern Maine, and but for the delay in the arrival of rails remarkable records would probably have been made. It is now expected to complete the track laying to Presque Isle this year. The grading will reach Caribou, above Presque Isle, early in September and will also be completed in that month on the Fort Fairfield Branch, which leaves the main line just south of Presque Isle. There are a number of bridges on the line between Houlton and Presque Isle which were detailed in a note in this column on July 13. Temporary structures will be built for the present to be replaced next year. The most important structures are the bridge just above Houlton and the viaduct at Monticello near that town. North of Presque Isle is the long bridge across the Aroostook, and as it is not advisable to build a temporary structure at that point, the extension of the line beyond Presque Isle must be delayed until another year.

Beaver Meadow, Tresckow & Boston.—The contract for building this new railroad has been awarded to Harry King. The projector of this road is A. S. Van Wickle, of Hazleton, Pa. It will extend from Beaver Meadow to New Boston, 18 miles; at this point it will connect with the Pennsylvania, and will give that road an entrance into a new territory.

Beech Creek, Altoona & Southwestern.—This company has been incorporated in Pennsylvania to build a railroad from Walkers, Cambria County, southwest by way of Altoona and Hollidaysburg to Ore Hill, Blair County, connecting there with the Altoona Short Line. Samuel P. Langdon, of Philadelphia, is President. The directors are: William T. Forsythe, Avondale; George W. Dickey, Houtzdale; William E. Steen, Bryn Mawr; S. I. Fries, S. J. Westley, William Loudon, Warren S. Lee, William J. Heinsling and John Loudon, Altoona.

Blue Mountain.—The projectors of this company, organized to build a railroad over the old route of the South Mountain project, now have engineers working near Hamburg, and at Reading, Pa., resurveying portions of the line already located from those points to Harrisburg, Pa. It is also intended to have a survey made east of Hamburg to Slatington, Pa., 23 miles. The route of the railroad as given by the projectors is from Harrisburg through the counties of Dauphin, Lebanon, Berks and Lehigh, the towns of Fredericksburg, Millersburg and Hamburg being the most important reached on the main lines, and Strausstown and Bernville on the branch to Reading. The line from Harrisburg to Hamburg is nearly three-fourths built, and the engineers are expected to report in about three weeks as to the amount of new work which will be required between those points and what portions of the existing road bed will have to be repaired or built. Until this report is received no contracts will be given out, but the officers state that arrangements will be concluded by that time with New York

parties to furnish the necessary funds, so that the work can go ahead as soon as it is known just what work will be necessary. James Clark, of 926 Walnut street, Philadelphia, will be Superintendent of Construction. He is a contractor who has been engaged on the Pennsylvania Railroad, the Erie & Sunsbury, Morris & Essex and other lines. The officers are given in another column. W. C. Mayne, of Philadelphia, who is the most active projector, has recently established offices at Millersburg to push the project.

Brainerd & Northern Minnesota.—Foley Bros. & Guthrie, of St. Paul, have secured the contract to build about 15 miles of additional track for this railroad. They have nearly completed their original contract on which work began in the spring. Eleven miles of the additional track now contracted for is an extension of the main line toward Leech Lake, the remaining three or four miles are feeders at different points along the road. The work on the extension will be commenced at once.

Canada Eastern.—This company has purchased 30,000 hemlock, cedar and spruce ties to be used on the extension from Chatham, N. B., to Black Brook and in building the loop line to Nelson. J. B. Snowball, of Chatham, is General Manager.

Elkton, Massey's & Middletown.—The route for the new branch of the Pennsylvania between Elkton and Chesapeake City, about eight miles, in the eastern peninsular of Maryland, has been practically decided on and nearly all the right of way secured, with the exception of the line in Elkton; Jacob Tome, of Port Deposit, Md., is President.

Georgetown & Granger.—A meeting of citizens was held in Georgetown, Tex., on July 25, to hear a proposition in regard to building this railroad. The people of Georgetown and Granger graded the roadbed nearly two years ago, but since that time nothing has been done. M. P. Kelley offered to build, equip and operate the road if a majority of the stock be transferred to him and the company which he represents. If the proposition is accepted Mr. Kelley proposes to begin work by next January and complete the road within a year. J. E. Cooper was appointed trustee and Dr. J. C. Anderson, W. S. Leake and M. B. Lockett were appointed a local committee to arrange for the transfer. The former company spent more than $40,000 on the grading and right of way of the road, which is ten miles long.

Gulf & Interstate.—The engineers who are surveying the Texas division of this Populist scheme report that they have finished the surveys for the Beaumont branch to that town in southeastern Texas. It is announced by the officers that this branch is to be the first work to be completed by them. The rails, they say, have been ordered. The engineers are to continue the survey for the main line from a point on this branch in Chambers county to the north line of the state of Texas.

Harriman Coal, Iron & Railway Co.—The Brushy Mountain extension of the railroad line of this company, on which a good deal of grading was done in 1892, is to be completed by the Cumberland Construction Co., of which C. P. Perin, of Harriman, Tenn., is President. The line will be about 12 miles long, and will extend from the north side of the town of Harriman, Tenn., near the Emory river, to the coal fields on Brushy Mountain. This coal property has recently been purchased from the East Tennessee Land Co., which had formulated and put under way extensive plans for the development of its property before its failure. The work on the extension was resumed on June 23 and promises to be rapidly completed. J. E. Rodes is General Manager and G. W. Chandler Secretary and Treasurer of the Cumberland Construction Co., which is in charge of the work now going on as stated above.

Indiana Stone, Railroad & Quarries Co.—It is proposed to consolidate the Bedford Quarries Company, the Bedford Belt Railroad and the Evansville & Richmond by transferring the property of the two former companies, or the securities representing the entire ownership of these properties, to a new company, and to create the following new securities: $2,000,000 par value, of five per cent. bonds, secured by mortgage upon all the properties or the securities representing the same; $1,500,000 six per cent. income mortgage bonds; $2,000,000 common stock; $1,000,000 of the five per cent. bonds, $500,000 of the income bonds, and the $2,000,000 of common stock of the new company are to be issued for the purchase of the properties of the Bedford Quarries Co. and the Bedford Belt Railway Co.; $300,000 first mortgage fives and $300,000 incomes to be reserved for the purpose of acquiring equipment, providing the new company with additional working capital, and paying the expenses for carrying out the proposed arrangement. The present owners of the Belt Line and Quarries Companies have agreed to accept common stock of the new company for their equity in the properties.

First mortgage bondholders of the Evansville & Richmond are offered for their $500 par value first mortgage bonds of the new company $500, par value, of six per cent. income mortgage bonds, and $50 in cash. The bonds of the Evansville & Richmond thus acquired by the new company will be used for the purpose, if practicable, of purchasing the railroad of that company under foreclosure and bringing it under a common control with the new company.

Interoceanic (Mexico).—The extension from Jojutla on the Morelos division to Puente de Istlas, 20 kilometres, was opened for traffic on August 1. On the Matamoros division the work of construction from Chietla toward Acapulco is being steadily carried on. A branch from Chietla to Cuautla, on the Morelos division, shortening the distance from Chietla and points south of the city of Mexico, is also to be built.

Kansas, Oklahoma Central & Southwestern.—Robert Martin is reported to have returned to Guthrie, O. T., from London, where he secured the money necessary to construct this railroad. It will extend from Coffeyville, Kan., southwest across Oklahoma to Vernon, Tex., and to Albuquerque, N. M. The company has organized by electing the following officers: President, Gilbert Martin, Guthrie, O. T.; Vice-President, George Gardenhire, Stillwater, O. T.; Secretary, T. C. Frazier, Coffeyville, Kan.; Attorney, S. V. Powter.

Monterey Mineral.—This road is being built by Joseph A. Robertson and J. G. Trevino of the Monterey & Mexican Gulf road, who intend to operate it as an independent company. The road will leave the Mexican National west of the station at Monterey, Mex., and will extend to the works of the Monterey Industrial Co., and then cross the tracks of the Mexican National north of the station, through the grounds of the Saddle Mountain Brick & Tile Co. to the San Pedro and San Pablo mines, in the Sierra Madras Mountains, south of Monterey. There will also be a spur into the City of Monterey to connect with street car lines. The length of the road will be 24 kilometers. There will be three rails, so that there will be 3 ft. gage and 4 ft. 8½ in. gage tracks. Surveys have been made, the plans approved by the Government and the work of grading commenced. It is expected that trains will be running over the line by November 1. A heavy business will be done in carrying ore, timber and wood. William H. Wentworth, of Monterey, is engineer in charge.

New Roads.—The Newport Commercial League of Newport, Ark., has appointed a committee, consisting of L. Minor, I. Goldman and W. A. Billingsley to employ an engineer to make surveys for a railroad between Newport and Bonnerville about 15 miles, to connect with the Kansas City, Memphis & Burlington at the latter town, thus making a direct route to Memphis.

L. M. Staples and J. S. Burns, of Washington, Me., have been in Gardiner, Me., trying to arouse interest in a proposed railroad to connect the towns of Whitefield, Jefferson, Washington and Unity with the Georges Valley Railroad, and the Kennebec Central.

The branch road of 15 miles from Sprague's Mills, Me., to the Maine Centralat Fairfield, is nearly completed.

Ottawa, Arnprior & Parry Sound.—Chief Engineer George A. Mountain states that the line will be completed to Long Lake, 142 miles west of Ottawa, and passenger trains running to that point this fall. With 40 miles constructed at the Parry Sound end of the line, only 70 miles will remain between the two points. At present there are 1,600 men at work on the eastern end of the line and 500 on the western end. About 300 teams are also employed on the construction. William Heald has completed his second ten miles section west of Evanville; J. O'Brien's 12 mile contract to Barry's Bay, and E. Fauquier's contract beyond the Haggarty Pass will be completed by September 1.

Pennsylvania Midland (South Mountain).—A party of engineers under J. H. Murphy, of Reading, Pa., Chief Engineer, has been organized to relocate for this company, recently organized with G. G. Williams, of Philadelphia, as President, portions of the line of the South Mountain road between Harrisburg and Slatington, Pa The engineers of the Blue Mountain road, mentioned elsewhere, are engaged in a similar work. The engineers are to report at a meeting of the directors to be held in Philadelphia during the month. The directors will be ready after that meeting, it is said, to receive bids for the work proposed. James March, Jr., Lebanon, Right of Way Agent, started out from Harrisburg on August 7 to revive the old rights-of-way consents. Philip W. Averitt, of Hagerstown, Md., Superintendent of Construction, states that his company will go ahead without regard to the Blue Mountain Railroad Co., which claims a prior right to the abandoned roadway.

Petersburg Belt.—The contractors are making rapid progress in the construction of this belt line around Petersburg, Va., which involves much difficult work. The officers of the Richmond & Petersburg and Petersburg roads which are providing for the building of the belt line anticipate that it will be ready for operation by December 1. The line is to be six miles long.

Philadelphia & Reading.—It is stated that A. S. Van Wickle has leased the Tamakua, Hazleton & Northern branch and will construct a connecting link between Treskow and Leviston, Pa., for the transportation of his own coal from the latter point.

Pittsburgh, Cincinnati, Chicago & St. Louis.—The right of way for a belt line at Elwood, Ind., has been secured and construction work will be commenced at once. The belt line will be about four miles long.

Raymond.—This company has been incorporated in Florida to build a railroad six miles long. The officers are: Cyrus Raymond, President, Danbury, Conn., Herschel P. Walker, Vice-President, Auburndale, Fla., G. B. Raymond, General Manager, Peter M. Osborn, Secretary, Danbury, Conn., and W. C. Edmiston, Treasurer, of Auburndale, Fla.

Robeline & Sabine Parish.—President John R. Jones, of the Caddo Mills Lumber Co., of Shreveport, La., has signed an agreement with the local committee of Many to extend the railroad being built by his company from Victoria to Many, in Sabine parish, La. This will make the line about 23 miles long, giving it connection with the Texas & Pacific at Many.

St. Louis, Avoyelles & Southwestern.—The parish of Marksville, La., has voted a special tax of five mills for ten years to aid in the construction of a road from Bunkie to Marksville and Simmesport, La. F. M. Welch, of Alexandria, is President.

San Pete Valley.—Work began on Aug. 1 on the grading of an extension for eight miles south of Manti, Utah. The extension, is to reach some valuable coal deposits owned by the railroad company under the title of the Sterling Coal & Coke Co. It will parallel the tracks of the Rio Grande Western as far as Sterling. The contract for the grading has been let to Henry Beale, of Ephraim, Utah, and he is to have the roadbed ready for the ties by Sept. 15, when track laying will commence. It is expected that trains will be running to the mines in October. This is the second extension of the road in the past year. The line is now 44 miles long, south of Salt Lake City. Over $250,000 was expended in the last extension of twenty miles. The terminus of the road will be at a town called Morrison in Six Mile Canyon. Theodore Bruback, of Salt Lake City, is President.

Schenectady, Sacandaga & Northern.—J. W. Latcher, of Tribes Hill, N. Y., has been looking over the route of this proposed railroad. The road will start from the New York Central Railroad bridge at Schenectady and run northward through Glenville to a point west of Charlton village, then west near West Charlton, to within one mile of West Galway, and then to Broadalbin village, crossing the Sacandaga river at Northville, down the west bank to Conklingville and Hadley, and finally to Glen Falls. For a distance of 37 miles, from Schenectady to Hadley, the grade is excellent. The rest of the way is almost entirely earthwork.

Salt Lake & Mercur.—Daniels & Holdaway, of Provo, are making rapid headway on the grading for the railroad to Mercur. The graders are working from Fairfield toward the mines at Mercur, Utah. The road will be nine miles long and is being built to the ore mines of the Mercur Mining Co., at Mercur. A. A. Noor, of Provo, Utah, is President of the company.

Swift River.—Mr. Edward Plummer, of Lisbon Falls, Me., one of the projectors of this road in Maine, reports that a party of 13 surveyors under Chief Engineer Stratton is engaged in laying out the route of the proposed railroad up Swift River. The road will connect with the Portland & Rumford Falls Railroad, and extend north to reach the timber lands along the river owned by the projectors.

Texas Midland.—The extension of the railroad has been completed to Ennis, Tex., a little over six miles in length. It starts from Midland Junction, which is two miles north of Garrett. Work is being pushed on another extension from Roberts to Greenville, a distance of 18 miles. Over one-half the grading has been completed and several miles of ties and rails distributed along the line. It will be ready for traffic by September 1

Waddington, Canton & Southern.—This company was incorporated in New York on August 7 to construct a standard gage steam road about 28 miles long from a point on Dry Island, in the St. Lawrence river near Waddington, to High Falls, on the Grasse river, in Canton, St. Lawrence County. The capital is $500,000, and the directors James Spears, John C. Keeler, Henry E. Seaver, Reuben T. Wells, and Simeon D. Bridge, of Canton; John G. Tait and William W. Proctor, of Waddington; Frederick J. Merriman, of Madrid, and Joseph G. Taylor, of Buffalo, N. Y.

West Virginia, Ohio & Western.—This company has been incorporated in West Virginia to build a railroad from Belington, Barbour County, W. Va., the present terminus of the West Virginia Central & Pittsburg, northwest along the Valley and Buckhannon Rivers, and Elk Creek to Clarksburg and along the West Fork of the Monongahela River to the mouth of Ten Mile Creek, thence along Ten mile and Fishing Creeks to New Martinsville. Engineers are now at work locating the line between Clarksburg and New Martinsville, a distance of about 40 miles. The first meeting of the company will be held on August 27, at Clarksburg, which is the principal office of the company. The proposed road runs almost continuously through the Pittsburg vein of bituminous coal which is said to be the largest unbroken coal field in WestVirginia. Thomas Pettigrew is Chief Engineer of the company.

GENERAL RAILROAD NEWS.

Atchison, Topeka & Santa Fe.—Judge C. G. Foster, of the United States District Court in Topeka, Kan., has granted an order to the receivers authorizing them to negotiate a loan of $250,000 with which to assist in paying over-due wages to employees of the company. The receivers were forced to take this step because of the demoralized condition of business and immense reduction in the revenue occasioned by the strike.

Atchison, Topeka & Santa Fe.—The United States Circuit Court at Topeka, Kan., has given the receivers of the railroad authority to borrow $1,500,000 on receivers' certificates. This increases the receivers' debt to $1,750,000, $250,000 having been issued a few weeks ago. Of the new issue $75,000 is to pay employees and other bills, and a like amount will be expended for taxes and expenses of terminal facilities.

Attica & Freedom.—This property is now controlled by S. S. Bullis, of Olean, N. Y., who proposes to rebuild it and open it for traffic between Attica and Arcade, a distance of twenty-six miles. The railroad has not been in operation since last March, but was recently purchased by Mr. Bullis, for $30,000, in connection with Mr. Merrick, of Bradford, Pa., and C. W. Conklin, also of Bradford, formerly Division Superintendent of the New York, Lake Erie & Western Railroad. The road is narrow gage but it will be reconstructed and changed to standard gage. The repair work is expected to be completed by September.

Baltimore & Lehigh.—The Pennsylvania section of this railroad was sold at York, Pa., on August 6, the property being purchased by G. L. Wilson, of Baltimore for $45,000. The sale was subject to a judgment for $281,000 secured by W. F. Walworth of Cleveland and secured by a mortgage lein on the line in Pennsylvania. The suit of a Maryland stockholder in the United States Court at Philadelphia to have this judgment declared invalid and to have the sale postponed had been denied in the week previous. The purchaser is understood to represent Baltimore interests formerly identified with the property. The road sold was formerly known as the York & Beach Bottom, extending from the city of York to the Susquehanna river, near the village of Peach Bottom, with a line to the Maryland State line at Delta. The Maryland portion of the road is known as the Maryland Central but the two sections have been operated separately by distinct Receivers for over a year.

Baltimore & Lehigh.—The property of the railroad in Maryland, recently purchased for $250,000 by the first mortgage bondholders, was transferred to them on August 1 by Receiver W. H. Bosley.

A certificate of incorporation of the new management, under the name of Baltimore & Lehigh Railway, was filed. The incorporators, A. Brown, J. Wilson Brown, John Gill, John K. Cowen and George C. Jenkins, with John S. Young, John W. Hall and Solomon Frank, were elected directors. The directors elected J. Wilson Brown, President, and John McHenry, Secretary and Treasurer. The capital stock is $3,000,000. Of this, 8,500 shares will be issued as paid-up capital and given to the holders of the first mortgage bonds in exchange for the bonds which will be surrendered. The total issue of first mortgage bonds is $850,000. The remaining 21,500 shares will not be issued at present. A mortgage of $250,000 has been created to pay off existing claims and settle with first mortgage bondholders who will not accede to terms of reorganization. The road has an agreement with the Baltimore Belt Railroad Company for the use of the Belt tunnel.

Canadian Pacific.—The report of earnings for June is as follows:

	1894.	1893.	Dec.
Gross earn	$1,458,683	$1,890,873	$432,190
Oper. expen	1,022,726	1,168,546	145,820
Net earn	$435,957	$722,327	$286,370
Six months to June 30:			
Gross earn	$8,137,769	$9,459,997	$1,322,228
Oper. expen	5,852,538	6,390,727	538,189
Net earn	$2,285,251	$3,069,270	$784,039

Chicago & Texas.—The Lineham Railway Transfer Co., which controls a number of transfer steamers on the Mississippi and Ohio Rivers, has made a contract with E. A. Hitchcock, of the Chicago & Texas Railroad, to put in a transfer steamer from Grand Tower to Crystal City, Mo., a distance of about 80 miles, Crystal City being some 30 miles south of St. Louis. The Chicago & Texas Railroad, for which the transfer is to be operated, controls 60 miles of railroad in Illinois from Grand Tower on the Mississippi River to Murphysboro, Harrison and Carbondale, reaching important coal fields at those points.

Carolina Central.—The bondholders propose to contest the attempt of the Seaboard & Roanoke to scale the interest on the 6 per cent. bonds of this company. A de-

fault in the payment of the last interest due in July was made, the Seaboard & Roanoke claiming that the road has not earned the interest. It now asks the bondholders to accept new 4½ per cent. bonds, the new bonds to be only three-fourths of the total of the present issue. A meeting of the bondholders was held at 60 Wall street, New York, last week, when over $1,600,000 of the bonds were represented. There was a good deal of pronounced opposition to the terms offered by the Seaboard & Roanoke but no definite action was taken, the meeting being adjourned to August 17.

Chicago Great Western.—The company has secured a passenger terminal in the city portion of Kansas City, Mo., by an agreement with the Kansas City Suburban Belt Railroad, over which its trains will hereafter be run into Kansas City to that company's station at Second and Wyandotte streets. The Kansas City terminus of the Chicago Great Western has heretofore been at the Wood street station in Kansas City, Kan.

Chicago, Milwaukee & St. Paul.—The gross earnings for June were $2,383,942, a decrease of $521,049 as compared with the same month of last year, and net earnings were $960,465, a decrease of $98,441. For the twelve months ending June 30 the gross earnings were $31,327,931, a decrease of $4,415,497 as compared with the corresponding period of last year, and net $11,213,618, a decrease of $816,867.

Denver, Leadville & Gunnison.—The Union Pacific ceased to operate this railroad in Colorado as part of its system on August 6. On that day the property was transferred to Frank Trumble, Receiver of the Union Pacific, Denver & Gulf, who on August 4 had been appointed Receiver by Judge Hallett under a bill of foreclosure filed by the American Loan & Trust Co., of Boston. The separation of this line from the Union Pacific System leaves it operating in Colorado only the line from Denver to Cheyenne and the branch to La Salle. The South Park road, as it is called, operates nearly 320 miles of narrow gage line, reaching mining districts in Colorado, the main line extending from Denver to Gunnison and Baldwin and to Leadville.

Green Bay, Winona & St. Paul.—Default was made on August 1 in the interest payment on the first consolidated mortgage 5 per cent. bonds of this company which were issued in 1892. The company was reorganized in that year and $2,500,000 of the bonds were issued on the 215 miles of railroad operated. President Walker says that the present default is only a temporary one and that it is not likely to be followed by either foreclosure or receivership.

Houston, East & West Texas.—The conversion of the line between Houston, Tex., and Shrevesport, La., 230 miles, was accomplished on July 29. The widening of the gage has been under consideration by the company for some years and three months ago it was definitely decided to undertake the work this summer. Since then the contracts for the new standard gage equipment, including 18 locomotives and 300 passenger and freight cars, have been contracted for. All the freight cars owned by the company, which it was thought were good for three years' service, have been remodelled and repaired and standard gage trucks put under them, Master Mechanic A. S. Grant having about 100 men to do the work. A force of 1,000 men was employed to change the gage, being divided into 32 gangs of 35 men each, and 4 gangs of 50 men. They were distributed at distances of 6 miles apart, the four gangs of 50 men being placed 13 miles apart. The mileage changed is 232 miles, the main line of the railroad between Houston and Shreveport. The officers of the company have prepared an interesting historical statement of the railroad. It was projected by Paul Bremond, identified in many ways with the development of Texas and the builder of the first railroad in that state. His idea was to connect the Houston East & West Texas Railroad with the Houston & Shreveport from Shreveport to Logansport, La., which was built and owned by him. The new company was chartered in March, 1875, and construction was commenced in the following year. It was not completed until 1885, the year that Colonel Bremond died. Soon after his death a receiver was appointed in the person of M. G. Howe, who held that office from 1885 until March 1893, when he was succeeded by other receivers. The property had been purchased at a foreclosure sale in August, 1892, by E. S. Jamison, representing the first mortgage bondholders. and the new company assumed control of the property in June, 1893. E. S. Jamison is President, M. G. Howe is Vice-President and General Manager, and Thomas Cronin is Superintendent.

Indianapolis, Springfield & Western.—The first mortgage bondholders of the Indianapolis, Decatur & Springfield Railroad, which has been merged through reorganization into the Indianapolis, Springfield & Western, met in New York this week. The Reorganization Committee reported that in order to protect the interests of parties holding liens, two companies had been organized, the Indiana, Decatur & Western and the Decatur & Eastern companies, the last named company to be under lease to the first named. The committee did not think it advisable to proceed further with a definite reorganization of the property. It purchased the road on May 10 for $1,800,000, the amount of the first mortgage bonds outstanding. The following were elected directors of the Indianapolis, Decatur & Western Railway Company: H. W. Smith, President; T. W. Morris, Vice-President; F. S. Smithers, Treasurer; C. A. Smith, Secretary, and William A. Read Frank C. Hollins, A. L. Mason, directors.

Kansas Pacific.—The Consolidated Bondholders' Committee has prepared a memorial to Congress for the passage of a bill to expedite legal proceedings by the United States and other creditors against Government-aided railroads. The memorial alleges that there was a trust fund for the security of the bondholders, and that there has been a misappropriation of the securities in that fund. It states that the memorialists have brought suit against the estates of Jay Gould and Russell Sage, who were the trustees of that fund, which amounts, with interest, to more than $11,000,000.

Kentucky Midland.—All trains, both passenger and freight, over this railroad, which operates about 40 miles of road in Kentucky, were suspended for about two weeks after July 26 on account of a tax dispute with the city of Frankfort, Ky. Some agreement was made with the city and the operation of the road has been resumed. The road starts from Frankfort, reaching Paris, Ky.

Macon & Northern.—Judge Spear, of the United States Circuit Court, has signed a decree for the foreclosure sale of this road at Macon, Ga., on October 2, in the suit of the Mercantile Trust Co., of New York, trustee of the first mortgage bonds, amounting to $2,200,000. The Macon & Northern operates a line from Macon to Athens, Ga., 107 miles, and was built in 1888. The road was leased in 1891 by the Central of Georgia and the Richmond & Danville, but the Richmond & Danville refused to be responsible for its half of the interest due in September, 1892. The interest was paid by the Central or Georgia, but later that company allowed a default to be made. The present proceedings were commenced in March, 1893, by the Mercantile Trust Co., of New York, and Alexander Brown & Co., of Baltimore. Judge Spear's order provides that the minimum price to be accepted for the property is $1,070,000. He had been asked to take $250,000, the minimum price for the property.

Missouri Pacific.—The company has appealed to the Supreme Court in Nebraska for a rehearing of the case wherein the Fitzgerald-Mallory Construction Co. secured a judgment against the road for $800,000. The defendants claim that important oral testimony was omitted at the former trials and claim the right to introduce such. The petition is under advisement.

New York, Lake Erie & Western.—The earnings for June including all leased and operated lines are shown in the following tables.

	1893.	1894.	Dec.
Gross earn	$2,668,682	$2,180,421	$488,261
Oper. expen	1,704,735	1,460,032	244,703
Balance	$963,947	$720,389	$243,558
Rentals	205,814	176,960	28,854
Net earn	$758,133	$543,429	$214,704
OCTOBER TO JUNE 30.			
Gross earn	$22,369,229	$18,684,812	$3,684,417
Oper. expen	14,957,404	13,440,543	1,516,859
Balance	$7,411,825	$5,244,269	$2,167,556
Rentals	1,974,899	1,661,691	313,209
Net earn	$5,436,926	$3,582,578	$1,854,347

New York & New England.—The hearing at Boston before the special master on the application of the receivers for permission to make a further issue of $990,550 receivers' certificates was concluded on July 31. Counsel for the Reorganization Committee said that the committee had practically received deposit of all the common and preferred stock and $4,552,000 out of $5,000,000 second mortgage bonds, and it was imperative that the receivers' certificates be issued immediately, in order to lay rails, ballast, and make necessary improvements before the season was too far advanced. Out of the $500,000 receivers' certificates authorized by Judge Colt, all have been issued except $30,000, and all were taken by the Reorganization Committee and stood ready to take $664,555 of these new certificates. The second mortgage bondholders objected to the issue of receivers' certificates for repairs.

Norfolk & Western.—The report for June and for the six months to June 30, makes the following comparisons:

Month of June.

	1894.	1893.	Inc. or Dec, I., 11 = 1 p. c.
Miles operated	1567	1556	
Pass., mail and exp. earn	$157,733	$184,200	D., $26,467 = 14 p. c.
Freight earn	758,381	645,195	I., 113,186 = 18 "
Gross earn	$916,114	$829,395	I., $86,719 = 10 p. c.
Expen. incl. taxes	680,618	609,535	I., 71,083 = 12 "
Net earn	$235,496	$219,860	I., $15,636 = 7 p. c.
Proportion of expenses to gross earn	74 p. c.	73 p. c.	

Six months to June 30th:

	1567	1556	I., 11 = 1 p. c.
Miles operated			
Pass., mail and exp. earn	$828,774	$1.000,128	D., $171,354 = 17 p.c.
Freight earn	4,026,403	4,076,693	D., 50,290 = 1 "
Gross earn	$4,855,177	$5,076,821	D., $221,644 = 4 "
Expen. incl. taxes	3,640,747	3,763,212	D., 122,465 = 3 "
Net earn	$1,214,430	$1,313,608	D., $99,178 = 8 p.c
Proportion of expenses to gross earn	75 p. c.	74 p. c.	

Pittsburg, Akron & Western.—The foreclosure sale of this property under the first mortgage of $3,600,000, held by the Central Trust Company of New York, will take place at Akron, Ohio, on October 1.

Velasco Terminal.—A mortgage on the railroad of this company between Velasco and Chenango Junction, Tex., 20 miles, has been recently executed in favor of C. D. Farwell, of Chicago. This mortgage was given to satisfy judgment recently secured by the International & Great Northern to pay off other indebtedness and to provide a small sum for improvements to the property.

Zanesville, Mt. Vernon & Marion.—The long litigation over the Zanesville Belt Line, and the right of way of the Zanesville, Mt. Vernon & Marion road, promises soon to be settled. At a meeting of attorneys engaged in the case an agreement was arrived at which is to be submitted to the United States courts for ratification, and it is understood the two properties are to be sold. It is expected that the bondholders will be the purchasers.

TRAFFIC.

Traffic Notes.

Mr. E. P. Cowell, "locator of industries" for the Philadelphia & Reading Railroad, has found places for twenty-four manufactories on the line of that road during the past four months.

Now that the drouth has ruined the feed in western Nebraska the farmers are appealing to the State Board of Transportation to order the railroads to reduce rates to enable them to get in supplies for the winter.

Philadelphia papers report that passenger business on the Pennsylvania and on the Reading is good, and the statement is said to apply to both local and through traffic, while the seashore business to Atlantic City is heavy.

The Iowa roads have petitioned the State Board of Railroad Commissioners to revise the freight rates and classifications now in effect and to increase the maximum rates, on the ground that long experience has proved the present maximum rates to be inadequate and unremunerative. A hearing will be had at Des Moines August 21.

The anthracite coal trade continues dull. The bituminous coal trade has not only recovered from the strike, but shipments are now being made so freely that prices are in most cases down to what they were before the strike. About 13,000 miners returned to work in Pennsylvania on Monday last. Miners in New Mexico, both in the anthracite and bituminous mines, returned to work this week.

Judge Taft, of the United States Court at Cincinnati, who instructed the receiver of the Cincinnati, New Orleans & Texas Pacific to put in effect the low freight rates recently ordered by the Interstate Commerce Commission, also issued a temporary injunction restraining the Louisville & Nashville from disobeying the order of the Commission; but this temporary injunction was referred to Judge Lurton for further hearing at Louisville, and the latter has now refused to continue it.

During the month of July the freight movement through the Pennsylvania yards at Columbia was within 2,000 cars of the movement during the corresponding month of last year. This is considered a great run in view of the fact that freight traffic was very dull for a good part of the month on account of the strike. The movement was: Trains, East, 1,703; loaded cars, 52,757; empty cars, 1,162; total, 53,913. Trains West, 807; loaded cars, 9,012; empty cars, 44,124; total 53,136; total number of cars, 107,059. The total movement in July, 1893, was 109,072.

The New York Central announces that the New York and Chicago limited, the twenty-four-hour train starting from New York at 10.30 a. m., will be discontinued on August 11. The eastbound North Shore limited will also be taken off, so that aside from the fast mail there will be only two trains West and one East, running through in twenty-five hours or less. The North Shore limited will continue to run through westward in twenty-five hours, and the New York and Chicago limited, over the Lake Shore, will continue to run through eastward in twenty-four hours.

The Chicago, Rock Island & Pacific has discontinued all trains between St. Joseph, Mo., and Atchison, Kan., in consequence of the washing away of the approach to the east end of the Atchison bridge over the Missouri river. For some time past the trains of this road, as of all roads approaching Atchison from the East, have been running over the tracks of the Kansas City, St. Joseph & Council Bluffs in consequence of the erosion of the river bank, as reported in another column of this paper. It appears from a press dispatch published this week that the last named road has laid a temporary track by which to reach the bridge.

Chicago Traffic Matters.

CHICAGO, August 6, 1894.

There was very little change in eastbound tonnage last week from the preceding week. Westbound tonnage over Eastern lines is increasing slightly, mainly coal. Western lines report very little change. While later reports regarding crop conditions are not as alarming as at first, the continued drouth is affecting territory not previously suffering, and Western traffic officials are taking a very gloomy view of the general situation.

Lake freights are strong on coal and weak on grain and ore, coal rates under pressure of hurried shipments having advanced to 50 cents from Buffalo to Chicago and Milwaukee with prospects of still further advances. Grain moves slowly at 1 cent a bushel for small lots and ⅞ on cargo on corn, Chicago to Buffalo, only one full cargo being secured at Chicago last week. There is considerable apprehension felt over the possible disagreement between the lake and rail lines. If these lines are unable to agree on percentages, a general collapse of what little stability remains in lake and rail rates is likely to follow speedily. The lumber carrying trade will probably profit to some extent by the destruction of the large amount of lumber by fire at Chicago last week, but the lumber market is said to be still largely overstocked.

There is some cutting in eastbound passenger rates from San Francisco which the other lines are inclined to charge to the Union Pacific. This company denies the responsibility. It is not thought probable that any serious demoralization will result. The charges are by the Burlington against the Union Pacific and the St. Paul.

The Chicago shippers have not given up the idea of getting in the rates ordered by the Interstate Commerce Commission to Southern points. The Chicago and Ohio river roads are calmly waiting the outcome. The roads are probably satisfied with the present situation, but it will not do to offend the Chicago and Cincinnati shippers, so they wish them well in their fight.

A report is current that the Kansas City, Fort Scott & Gulf is withholding its assent to the proposed plan of the Western Trunk lines. The officers of the association claim that the trouble is of little moment.

As was to be expected, the other roads are following the lead of the Alton in announcing cheap excursions to Chicago, the Santa Fe and the Rock Island having announced similar excursions. The plan is to alternate the excursions by different roads on different dates.

Secretary J. W. Midgely of the Executive Board of Western and Southwestern lines, has advised the Eastern roads that he has no authority to call the Western lines together for the appointing of a conference committee on the car mileage question. This is taken as an intimation that the Western roads do not consider that it is necessary; that they have already put the one-half cent rate in effect and the other lines can follow suit or not.

The Illinois Central has abandoned the viaduct station at Van Buren street, which has been used for the suburban express trains since the close of the World's Fair, and these trains will in future start from the Randolph street station, using the old suburban station at Van Buren street.

The shipments of eastbound freight, not including live stock, from Chicago by all the lines for the week ending August 4, amounted to 47,783 tons, against 47,255 tons during the preceding week, an increase of 528 tons and against 49,898 tons for the corresponding week last year. The proportion carried by each road were:

Roads.	W'k to Aug. 4.		W'k to July 28.	
	Tons.	P. c.	Tons.	P.c.
Michigan Central	4,181	8.7	5 275	11.2
Wabash	3,186	6.7	1,478	3.1
Lake Shore & Mich. South	6,467	13.5	7,020	14.8
Pitts., Ft. Wayne & Chicago	6,462	13.5	6,742	14.3
Pitts., Cin., Chicago & St. L.	6,055	12.7	7,416	15.7
Baltimore & Ohio	3,077	6.4	2.973	6.3
Chicago & Grand Trunk	3,536	7.4	5,056	10.7
New York, Chic. & St. Louis	7,278	15.3	5,327	11.3
Chicago & Erie	5,894	12.3	4,735	10.0
C., C., C. & St. Louis	1,647	3.5	1,232	2.6
Totals	47,783	100.0	47,255	100.0

Of the above shipments 2,415 tons were flour, 12,401 tons grain and millstuff, 10,995 tons cured meats, 8,887 tons dressed beef, 1,570 tons butter, 1,642 tons hides and 7,094 tons lumber. The three Vanderbilt lines carried 37.5 per cent., the two Pennsylvania lines 27.2 per cent. Lake lines carried 51,705 tons against 50,335 tons last week.